TEXTILE WORLD

DECEMBER 1961 PRICE $1.00

A McGRAW-HILL PUBLICATION

TODAY'S FIBERS:

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Small Mills Can Compete

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. . . our answer to textile testing and R/D problems

"Knowing how" implies experience...having done it before...knowing what tools to use and how to use them...like high speed still and motion photography which catches the bouncing ball in action and reveals to our experienced eyes a wealth of information about deformation and restoration of carpet pile.

"Knowing how"—and what—to measure is the common denominator of everything we do thousands of times a day at United States Testing Company. With this "know how" we evaluate new finishes, fabrics, and blends; we solve difficult and unpredictable quality control problems in the mill; we keep profitable items from turning into costly fiascos and loss of good will.

United States Testing Company has been building a solid base under markets for new products and contributing to the advance of the textile industry since 1880. Why not put 80 years of experience to work for you?

United States Testing Company, Inc.

1415 Park Avenue, Hoboken, New Jersey

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The World's Most Diversified Independent Laboratory

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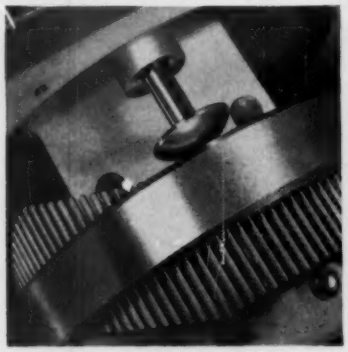
NEW WARNER & SWASEY SERVO-DRAFTER

provides weight control accuracy within 1%

Measuring rolls, *acting as a "sensing device", detect minute variations in weight of entering stock. These variations are automatically transmitted to a rotating memory wheel.*



Memory Wheel *introduces a time delay in machine response, allowing entering stock to travel from measuring rolls to draft rolls, and indicates changes in faller bars speeds.*

Available with can or ball delivery, automatic or manual doffing.

This new single head, single delivery Servo Drafter Intersecting Draw Frame has proven that it will produce higher quality yarns by maintaining consistent yard-for-yard sliver weight.

Extensive tests in various leading mills indicate that you can expect weight control accuracy within 1%. In a single draft, the machine can correct infeed weight variations of ± 25% in wools, synthetics, or blends. Calibration of the servo control during stock change-over is simple and can be done while the machine is running.

The new machine, which operates at a mean speed of 1500 D.P.M. retains all of the time-tested features of the Warner & Swasey Pin Drafter®, utilizes a combination hydraulic and mechanical system for simple maintenance and long-term operating dependability.

For complete facts on how this machine will fit into your blending, precombing, top making and drawing room operations, get in touch with our nearest sales office.

® Reg. U. S. Pat. Off.

You can produce it better, faster, for less... with a Warner & Swasey

TEXTILE MACHINERY SALES OFFICES—Main Office, Factory and Export Sales: 5701 Carnegie Ave., Cleveland 3, Ohio • P.O. Box 215, 20 Chestnut St., Needham 92, Mass. • P.O. Box 4000, 624 Pecan Ave., Charlotte 4, N. C. • Suburban Square Bldg., Ardmore (Phila.), Pa.

UNMATCHED VERSATILITY

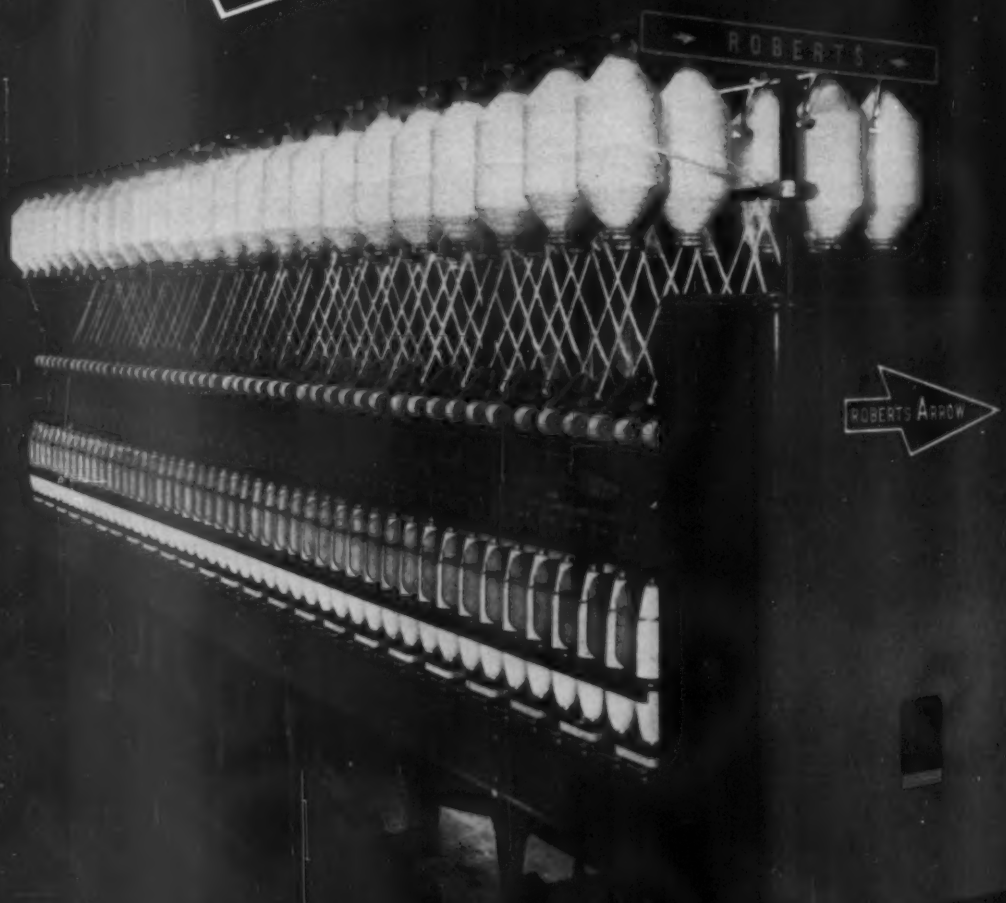
INCREASED SPEEDS

ATTRACTIVE LOW PRICE

BEST YARN QUALITY

RUGGED SIMPLICITY

ROBERTS ARROW



ROBERTS ARROW SPINNING for cotton, synthetic or worsted systems is available in all ball-bearing, rugged long-life frames of 25-inch or 36-inch width. More than 1,500 Arrow Frames are in mill operation.

ROBERTS COMPANY

SANFORD, NORTH CAROLINA

ROBERTS ARROW SPINNING.. AN INVESTMENT FOR PROFIT

Profit is the ultimate motive behind the purchase of new spinning or any other capital equipment. And profit essentially depends upon the spread between selling price and manufacturing costs.

In as keenly a competitive industry as textiles, profits are generally determined not so much by high prices but more by high quality coupled with low costs so that products of superior saleability, or value, can be offered.

In yarn spinning, low costs with high quality depend mainly on Versatility, Productivity, and Dependability.

The answer: Roberts Arrow Spinning . . . An Investment for Profit.

CUTS COSTS AND RAISES QUALITY 10 WAYS

➨ **INCREASED SPEEDS!** 20% to 50% higher, even up to 15,000 r.p.m. spindle speed, achieved by dynamic balancing of all components, plus maximum use of ball bearings.

➨ **UNMATCHED VERSATILITY!** Changes in fiber, yarn number, draft, twist and bobbin build are quickly accomplished. Coarse or fine yarns from 2s to 120s count. Choice of drafting systems: FC for short or long staple cotton plus staple synthetics to 2"; GS for synthetic fibers from 1½" to 3" or worsteds to 6½"; GW for all synthetic fibers, worsteds or blends up to 8" length.

➨ **HIGH DRAFTS!** A broad range of drafts from 10 to 60 is successfully handled on new Arrow Spinning, eliminating roving processes, improving fiber blending, increasing fiber control and upgrading quality.

➨ **HIGHEST YARN QUALITY!** New Arrow Spinning consistently spins stronger, more even yarns. Superior yarn quality with consistency from bobbin to bobbin is assured by simple, gadget-free drafting systems which provide effective fiber control and uniform weighting on all spindles.

➨ **REDUCED CLEANING, MAINTENANCE!** Elegantly functional, new Arrow Spinning has been designed and engineered for cleaner, trouble-free operation. Simplification of components, fewer parts and streamlined design provides reduced cleaning, more quickly done.

➨ **FULLY BALL BEARING EQUIPPED!** in all moving, turning, rotating and oscillating parts for smooth, dependable performance with substantially lowered electric power consumption. Lubrication requirements are eliminated or minimized.

➨ **SPACE SAVING WIDTH!** Only Arrow Spinning is available in both 25-inch and 36-inch widths. The 25-inch space-saving frame permits installation of five machines in the space formerly occupied by four, increasing spindleage and production by 25% in the same mill area.

➨ **BIGGER, HEAVIER PACKAGES!** Arrow Spinning puts more yarn on the bobbin, tighter wound due to better yarn tension through its frame geometry. Larger rings, longer bobbin lengths and improved bobbin build increase package size and weight, resulting in longer doff cycles plus substantial savings in winding with less knots.

➨ **RUGGED CONSTRUCTION!** and close precision of manufacture and assembly assure quality and long life of Arrow Spinning. Refined and streamlined, free of gadgetry and frills, and engineered for peak performance, new Arrow Spinning features many technological improvements contributing to better, less costly spinning.

➨ **ATTRACTIVE LOW PRICE!** The superior operational economy and productivity of new Arrow Spinning, and its new low investment cost, provide for a quick return on investment.

Installation of Arrow Spinning Frames,
Butte Mills Division, Jonathan Logan, Inc.

ROBERTS COMPANY
SANFORD, NORTH CAROLINA

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 3

TEXTILE WORLD

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Coming Next Month:

MODERNIZATION '62

TEXTILE WORLD will start the New Year with an entire issue devoted to Modernization 1962. You'll get reports on the top trends today in manufacturing, plant services, salary and pricing policies. What's more, you'll find four big cases in modernization—and a roundup of several short cases in modernization.

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GOODYEAR

EXCLUSIVE! GOODYEAR GREEN SEAL V-BELTS

to give you sets that are precision-matched in length to outperform...and outlast...all others

At no extra cost, GREEN SEAL *V-Belts also give you:*

Dimensional stability throughout the life of the belts via highly shrink- and stretch-resistant 3-T Process Cord or airplane-type steel cable.

Protection against dampness through special mildew-inhibited rubber compounds.

The most complete line of V-Belts in the industry—easily and quickly available through our nationwide network of distributors.

Still another "plus": The G.T.M.—Goodyear Technical Man—is available to help you select the right belts for any drive.

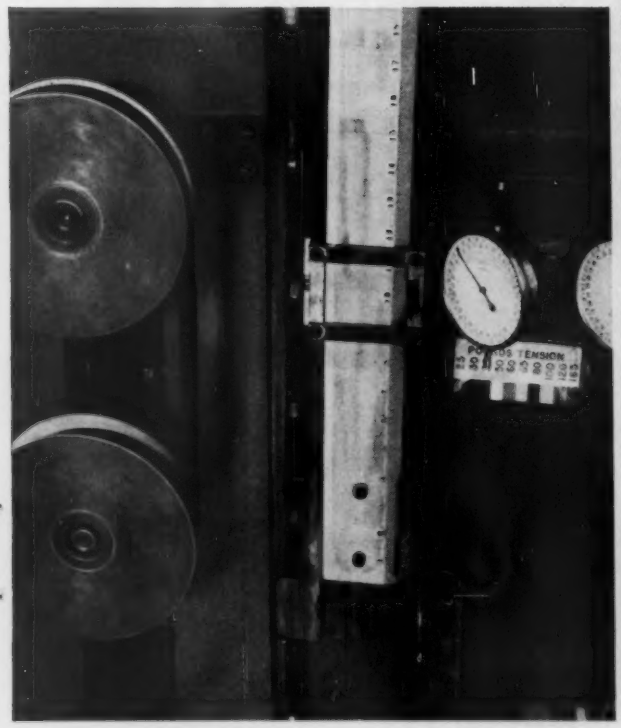
For your best buy in multiple drive belts—including new money- and space-saving HY-T Wedge V-Belts—look to Goodyear. Also, get the full story on P.D. (positive drive) Belts and Variable Speed Belts from your Goodyear Distributor. Or write Goodyear, Industrial Products Division, Akron 16, Ohio.

Lots of good things come from

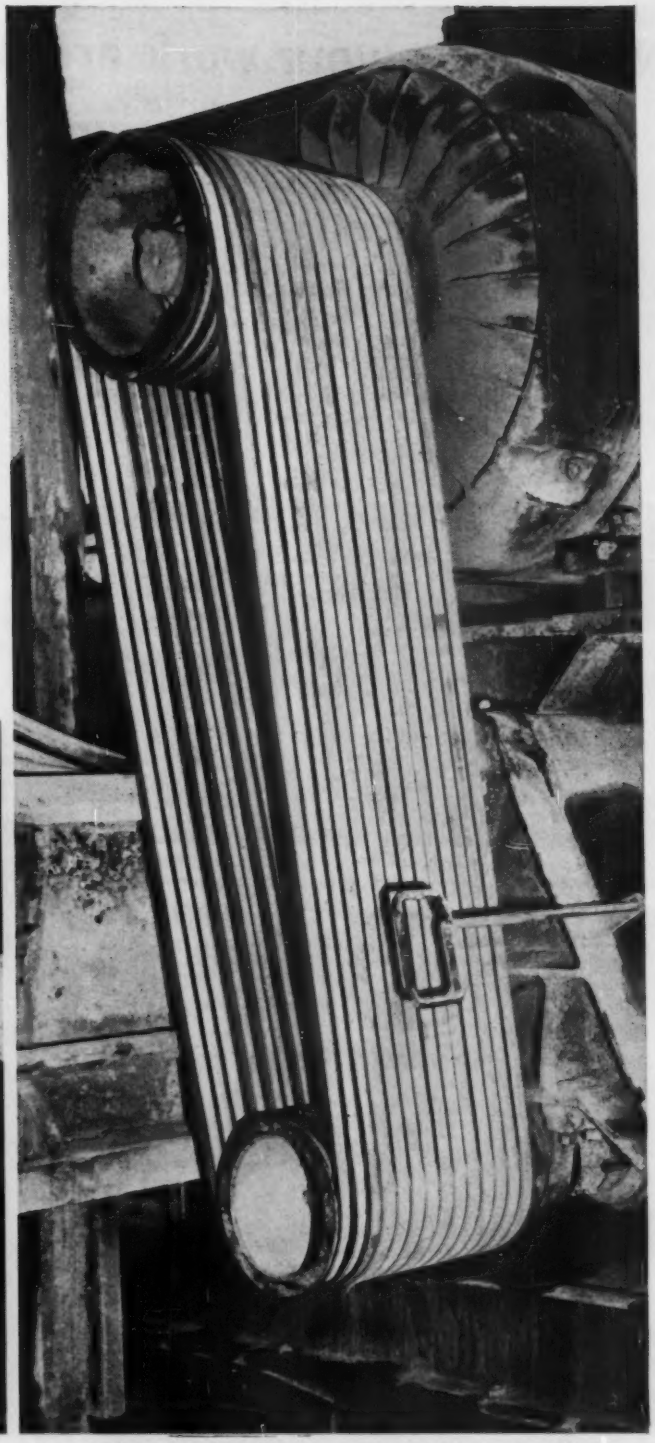
GOODYEAR INDUSTRIAL PRODUCTS

Compass, Green Seal, Hy-T, P.D.—T.M.'s
The Goodyear Tire & Rubber Company, Akron, Ohio

CODES TO 1/32"...



Length-coding GREEN SEAL V-Belts to 1/32"—not just 1/10" like most belts—takes this ultra-precision machine. *Only* Goodyear has this type of equipment, which is set by means of fine-tolerance steel templates to insure accuracy.



Harnessing this big, 22-saw stonecutter for 3 full years required COMPASS-V-Steel Belts by Goodyear. Over this period, the Goodyear belts helped carve up 20 tons of rock a day—over 15,000 tons in all. Normal V-belt life in this type of rugged service is a scant 6 months.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 7

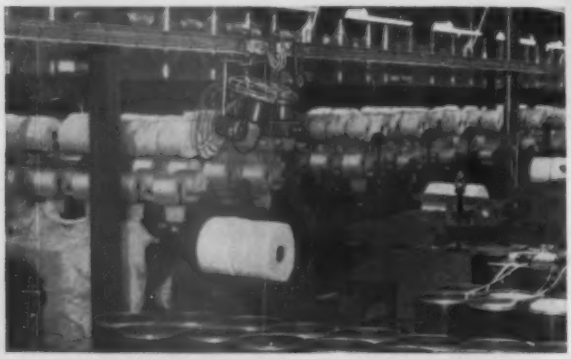
Now...keep your work areas clean automatically, with specially designed Amco Cleaners!

Amco has developed a wide selection of automatic cleaning equipment . . . designed to cut down manual cleaning, improve quality, and step up mill production.

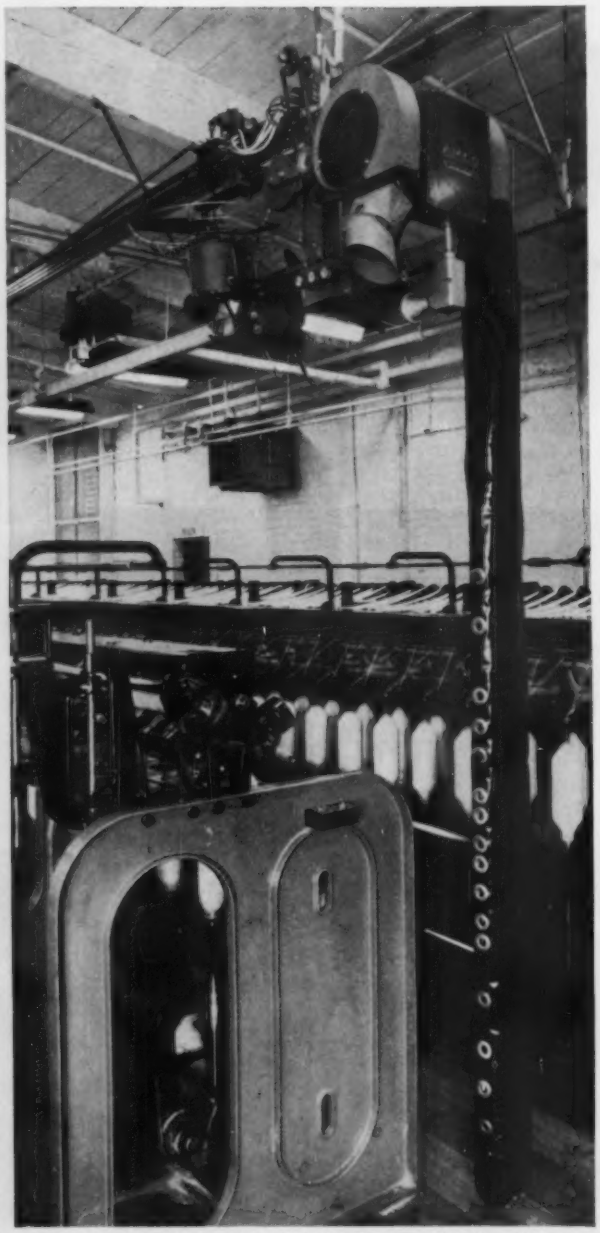
For money-saving facts about Amco Cleaners, call American Moistening Company — an organization with more than 70 years' experience serving the textile field.

Helicone Loom Cleaners improve quality of fabrics by preventing waste accumulation on stop motions, drop wires, harnesses and reed caps.

Amco Loom Cleaners over Draper shuttleless looms. Sheeting is being woven at high relative humidity.



Amco Ceiling Cleaner provides automatic cleaning of ceiling, beams, walls and other surfaces. Excellent for card room areas.



Amco's electronically controlled Roving Frame and Ceiling Cleaner. Air delivery boot takes care of specific lint-collecting trouble spots.

AMCO

SINCE 1888

Air Conditioning Equipment — Textile Specialties

American Moistening Company, Cleveland, North Carolina

Branches: Atlanta, Ga., Providence, R. I., Toronto, Ont.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 9→

Why Gates Lug Straps last longer... insure smoother operation

Super Tex-Hide Lug Straps

Users report up to five times longer service on their heaviest looms from Super Tex-Hide than from any other strap.

New Thin-Tex Lug Straps

When extreme flexibility and much lighter weight are needed, Thin-Tex Lug Straps give up to 25% longer life than ordinary straps... and smooth out loom operation.

Gates Distributors are in the YELLOW PAGES

The Mark of Specialized Research

Because of the great strength of Tex-Hide—a product of Gates *Specialized* Research—the block can be molded into the strap without the use of bolts or rivets. As a result, straps are streamlined and light in weight.

Yet, because of their superb resiliency, they give longer service, and smoother operation, *than any other strap you have ever used.*

2 big advantages of Gates Tex-Hide Lug Straps

1 Tex-Hide Lug Straps combine great strength with unsurpassed resiliency. They soak up blows and shocks *without taking any permanent stretch.*

2 Further, the great resiliency insures long life for *all parts* of the picking motion, and gives extended periods of operation *without any strap adjustments.*

The Gates Rubber Company

Denver, Colorado

Gates Rubber of Canada Ltd., Brantford, Ontario

Gates®

TPA 902

Take-up Roll Coverings
Card Bands
Cone and Evener Belts
Spinning Frame Drives

Reversible Pickers

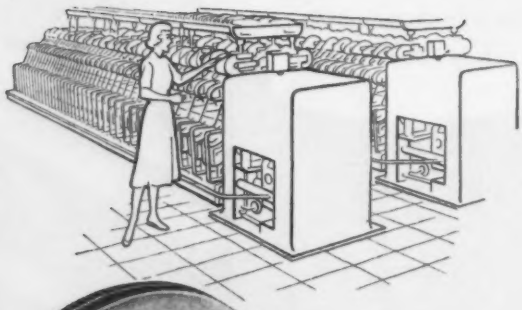
Tex-Hide Harness Straps

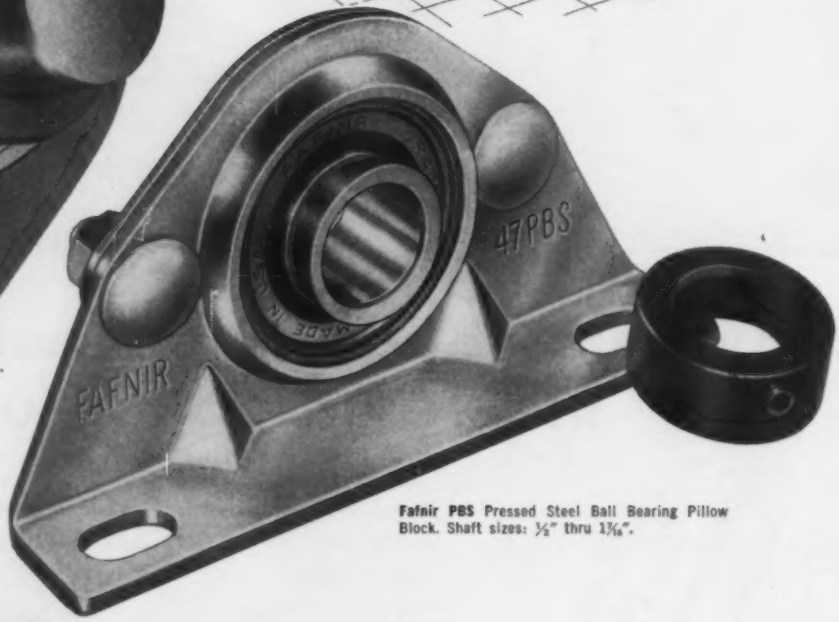
Tex-Hide and Vulco Loop Pickers

4-in-one Check Straps
Multi-Check Straps

Gates Textile Accessories

Fafnir FLCT Cast Iron Ball Bearing Flange Unit. Shaft sizes: ½" thru 1 15/16".





Fafnir PBS Pressed Steel Ball Bearing Pillow Block. Shaft sizes: ½" thru 1 15/16".

New FAFNIR Ball Bearing Units cut costs ...simplify textile equipment design

Fafnir permanently prelubricated precision ball bearings are self-aligning during installation. Integral Piya-Seals assure "best protection yet" against contaminants and lubricant leakage. Fafnir-originated self-locking collars provide fast, positive bearing installation.

Antifriction design comes easy . . . costs less . . . with these two new Fafnir Ball Bearing Units!

With the Fafnir PBS Pillow Block, you get a sturdy, compact "economy package" you can use on drive shafts and for a wide variety of light-duty requirements. The heavy-gauge pressed steel housing is strong, and plated for protection against corrosion.

The Fafnir FLCT Cast Iron Unit gives you rugged strength, and space-saving size, in a low-cost flange mounting. This unit can be used in gear boxes and similar applications.

Both new units are quickly and easily installed. And, they are readily interchangeable with more costly types on textile equipment of all kinds, from preparatory machinery to finishing equipment.

Investigate the economies — and design simplification — these new Fafnir Ball Bearing Units make possible. Call in your Fafnir representative. Or write for data sheets to The Fafnir Bearing Company, New Britain, Connecticut.

MADE IN U.S.A.

MADE IN U. S. A.
This stamp on a Fafnir Ball Bearing means finest quality and workmanship . . . dependable supply . . . competent engineering help . . . and responsibility in meeting your bearing needs. It's worth bearing in mind.

FAFNIR
BALL BEARINGS

SACM

COTTON CARD HP

r. w. n. license

Symbolized here
by its perforated doffer, the
HP Card will enable you to **increase:**
— the **Production** of your Carding Room,
— the **Quality** of your yarns,
— the **Profitability** of your mill.

Based on a new **pneumatic principle,**
the HP Card transfers the fibers
from the cylinder to the doffer "smoothly",
and the perfect balance of the masses in
motion allows high speeds
without mechanical fatigue.

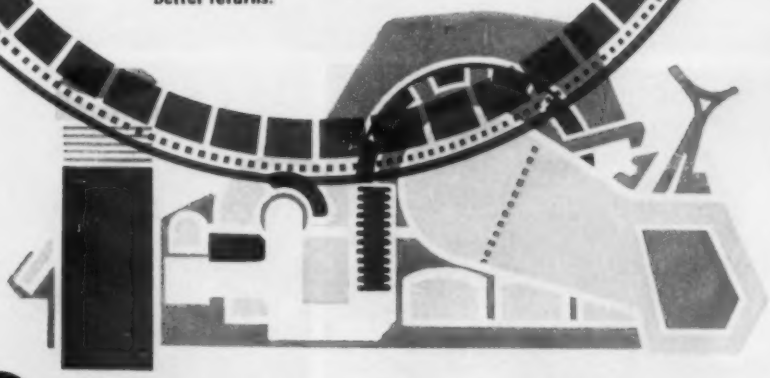
The **HP Card** reduces neps and produces
as much as **3 to 5 conventional Cards.**

The **HP Card** ensures excellent parallelism of the
fibers, **increases** of 8 to 15% in the **breaking**
strength of the yarns.

Fixed costs are reduced,
as the HP Card takes no more floor space
than an ordinary card.

It strips itself, and **production costs**
are reduced.

The **HP Card costs less** than those
which it replaces and **produces**
better returns.



SOCIÉTÉ ALSACIENNE DE CONSTRUCTIONS MÉCANIQUES MULHOUSE (FRANCE)
MAISON A PARIS 32, RUE DE LISBONNE

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 11

H. P. Talbert, Jr., Overseer of Spinning at Boger and Crawford Spinning Mills, Lincolnton, North Carolina, checks yarn quality with Wayne Downs, Armstrong representative. Accotex NC-727 roll covers are used on both the front and back rolls of this spinning frame. It is also equipped with NO-7075 aprons.

Your Armstrong man can help you get higher production, better yarn

Here's a combination you can count on to help you turn out yarn that's strong, smooth, uniform: your Armstrong man, and the wide range of materials available in the Accotex line of cots and aprons.

To keep yarn quality high, hundreds of mill men have standardized on Accotex products. These men know that Accotex materials offer the superior fiber control and smooth drafting action that mean high-quality yarn.

These men also know they can count on their Armstrong man for dependable suggestions on roll covering and apron problems. At Boger and Crawford Spinning Mills, for example, the Armstrong man is Wayne Downs, shown here working with mill personnel.

Be sure to call *your* Armstrong man on any roll covering or apron problem. Armstrong Cork Company, 6412 Dauphin St., Lancaster, Pennsylvania.

ACCOTEX® IS A TRADEMARK OF ARMSTRONG CORK COMPANY.

W. H. Martin, Overseer of Carding, and Wayne Downs inspect a roving frame, which has Accotex NC-727 roll covers on all four lines.

In the roll shop, Wayne chats with Noel C. Weaver, Foreman, about the importance of good roll maintenance.

J. L. Wright (at right), Superintendent, and D. C. Rudisill (left), Asst. Superintendent, learn about a new Accotex apron from Wayne Downs.

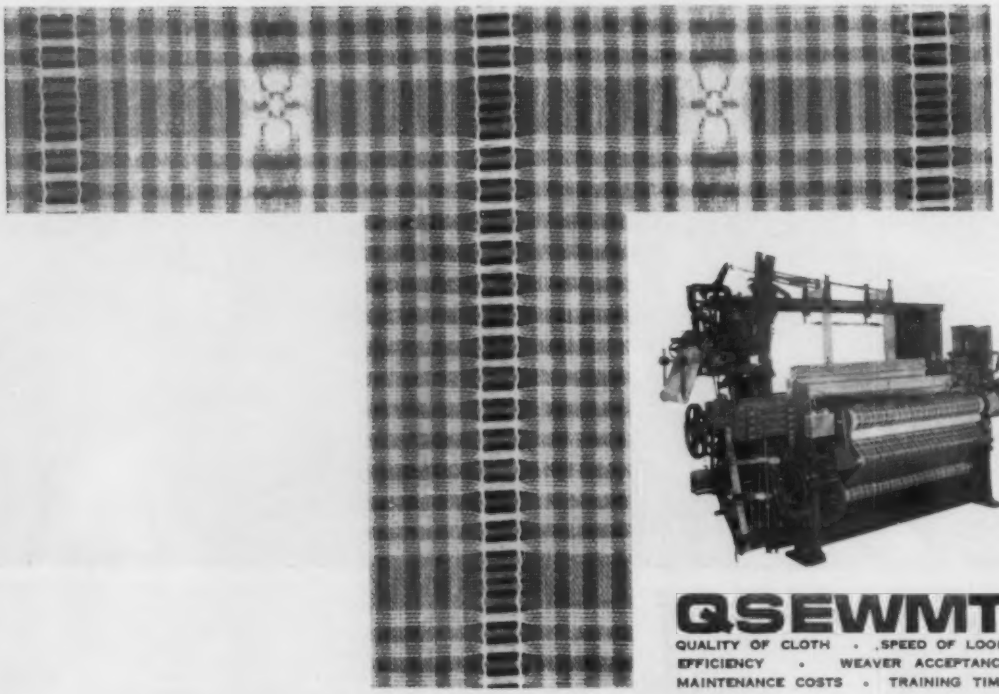
Armstrong
ACCOTEX COTS AND APRONS

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 13

TRAINING TIME for C&K's C-7 Loom is measurably shortened by the substitution of mechanical advantages for weavers' skills. Improvements engineered into the loom, such as electric controls, automatically do much of the thinking for the operator, and a sense of timing is not as essential.

Reduced skill requirements not only release trainees to work sooner but also enable more women to become weavers. Even inexperienced weavers can operate the loom safely at high speeds without difficulty. The resultant benefits are quicker proficiency and an increase in *average* workers' productivity.

The C-7 Loom is designed to produce more first quality cloth at higher efficiency and with less maintenance and labor costs. Crompton & Knowles has prepared a folder exploring each of the elements in this series. Send for it to see why the loom line that weaves the widest variety of fabrics ever—fancy cottons, synthetics, terry towels, ginghams, and dress goods—has big *advantages for your mill.*



QSEWMT

QUALITY OF CLOTH • SPEED OF LOOM
EFFICIENCY • WEAVER ACCEPTANCE
MAINTENANCE COSTS • TRAINING TIME

CROMPTON & KNOWLES CORPORATION

WORCESTER, MASSACHUSETTS

C&K

WORLD LEADERSHIP IN AUTOMATIC BOX LOOMS–RESEARCH–ENGINEERING–MANUFACTURE

CHARLOTTE, N. C. / ALLENTOWN, PA. / CROMPTON & KNOWLES JACQUARD & SUPPLY CO. PAWTUCKET, R.I. / CROMPTON & KNOWLES OF CANADA, LTD., MONTREAL, QUEBEC

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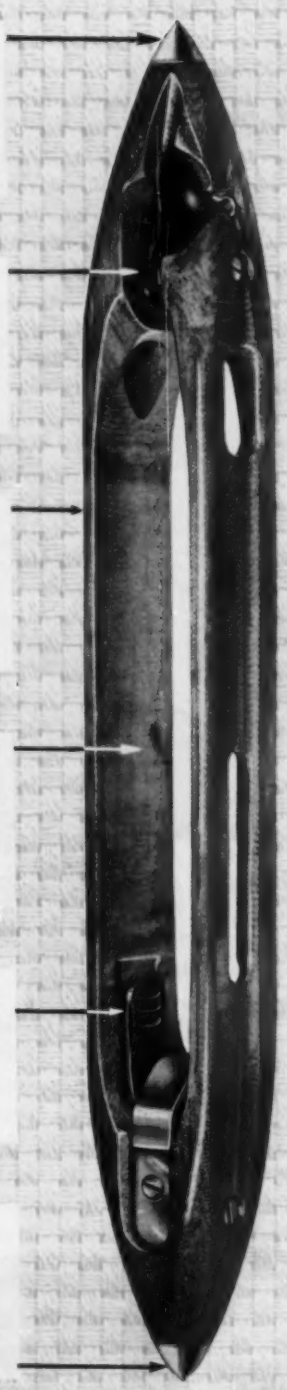
SAVE 50% ON SHUTTLE COSTS

With Southern DURAMOLD Shuttles



Inserted Tips, with today's miracle adhesives—virtually foolproof—with fiber washers to absorb shock.

Eyes, full range for any filling, fit better than wood, will stay tight longer.

Body is the toughest, strongest fabric-reinforced plastics available.

Chamber is the exact size and design you want.

Grips have better fit in the harder material, truer and longer-lasting quill alignment.

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You can be certain of getting unusually large savings on your shuttle costs when you invest in Southern DURAMOLD Shuttles. There is no other shuttle anywhere near this remarkable shuttle for quality and stamina.

Once you put Southern DURAMOLD Shuttles in your looms you haven't a care in the world as far as long, dependable, trouble-free shuttle performance is concerned. The reasons are shown at the left.

The record shows that Southern DURAMOLD Shuttles average *four times* the life of other shuttles, and reports of *six* or *seven times* the ordinary shuttle life are not uncommon.

Invest in Southern DURAMOLD Shuttles *right now* and start getting *your* bonus savings . . . plus better quality fabrics. Ask one of our qualified Sales Engineers to show how *you* can save money by using these outstanding quality shuttles.

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More and more textile finishers are profiting from the help B.F.Goodrich Chemical offers. You benefit from a wide variety of ideas, service and products for broadening textiles' appeal and lowering production costs when you write or call for information about the products and processes listed here—and many more. Department PF-12, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. In Canada: Kitchener, Ontario.

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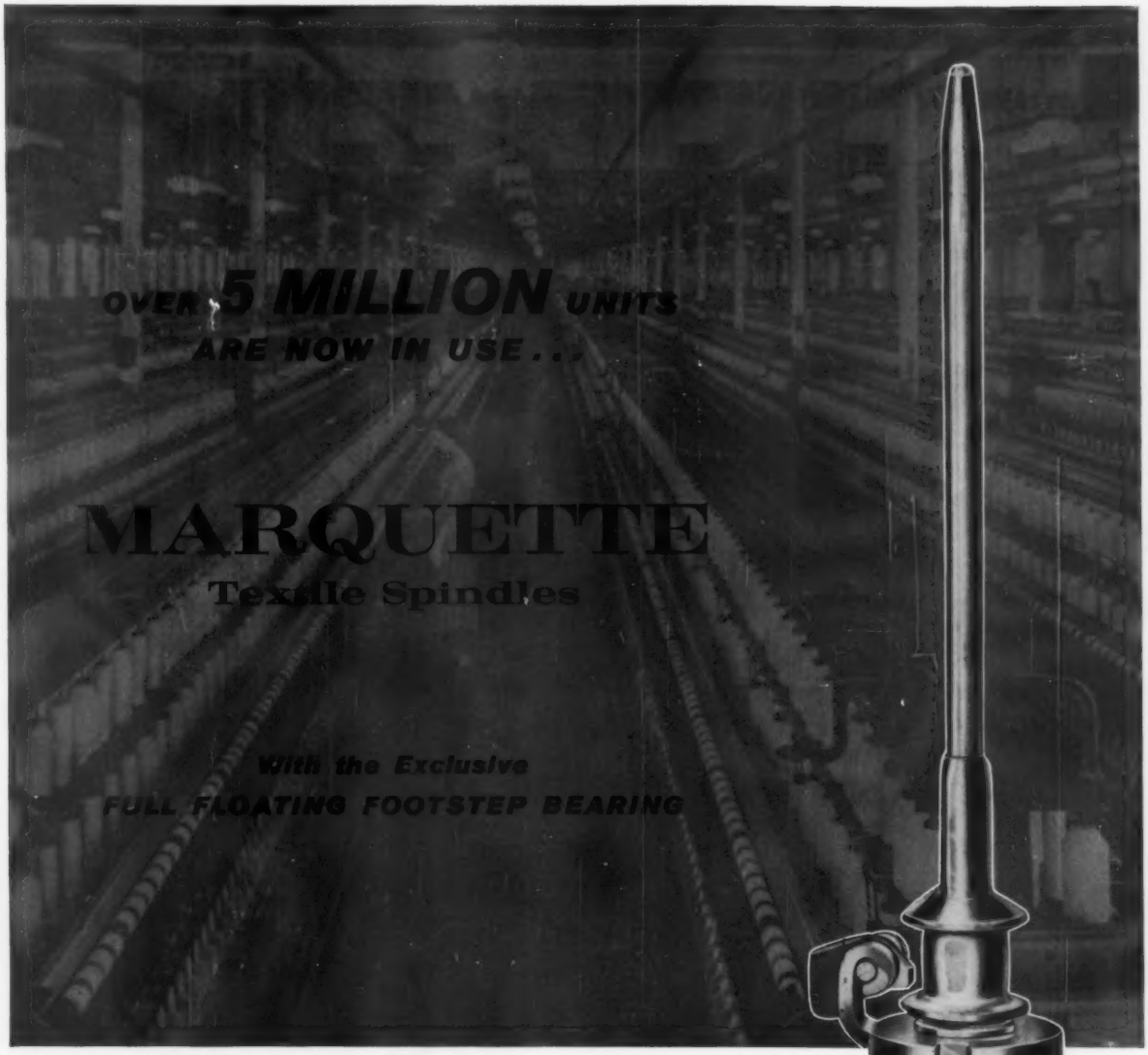

- **Higher speeds with heavier packages**
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Based on quality and performance — Marquette textile spindles are the continuing choice of profit-minded textile manufacturers.

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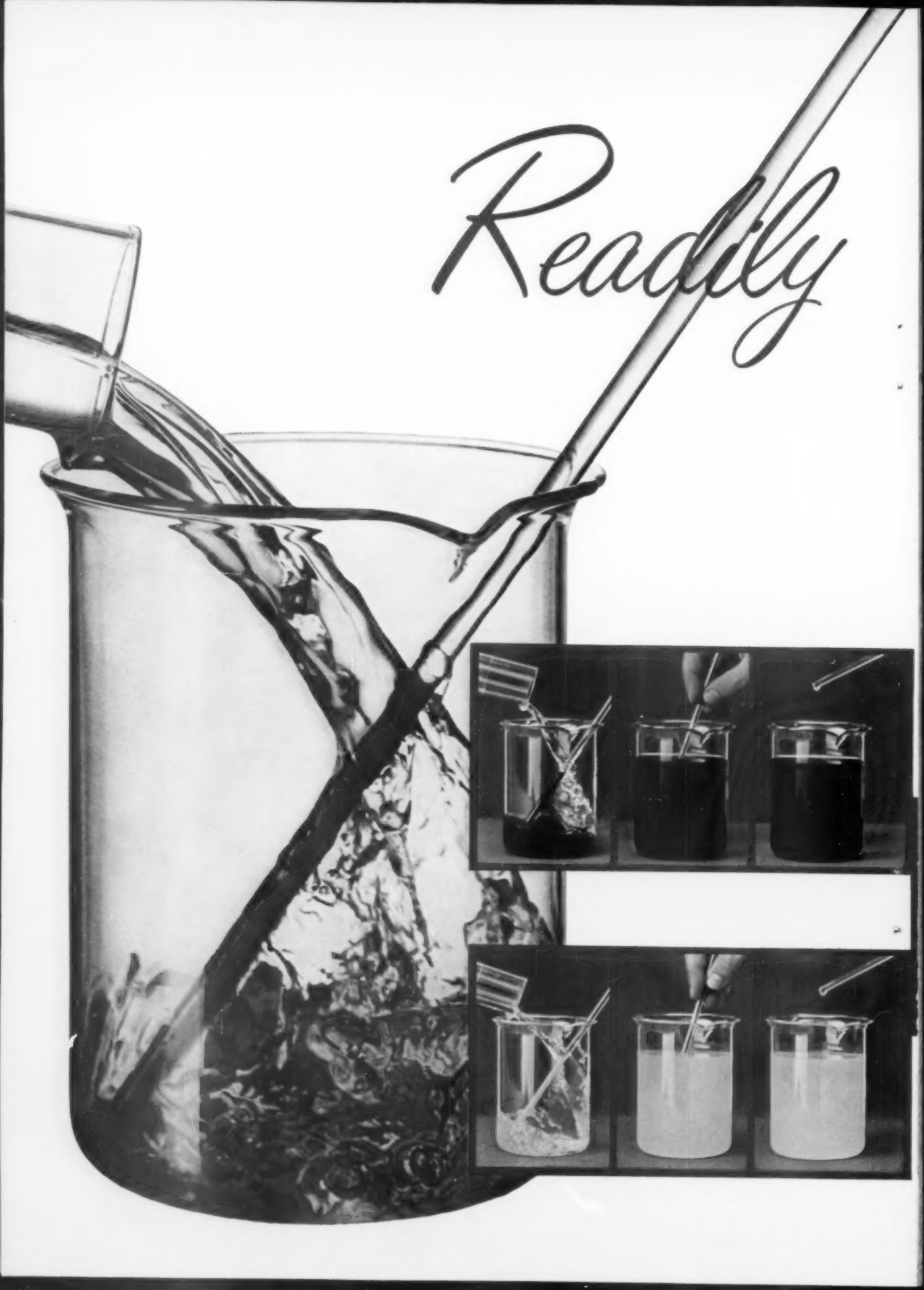
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another important reason to specify

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Within seconds, dried particles of National Aniline's Carbanthrene Vat Dyes redisperse in water at room temperature.

The same rapid redispersion takes place in stored drums . . . in your pad box . . . in package dyeing machines. As a result . . .

- piece goods are dyed clean and speck-free . . .
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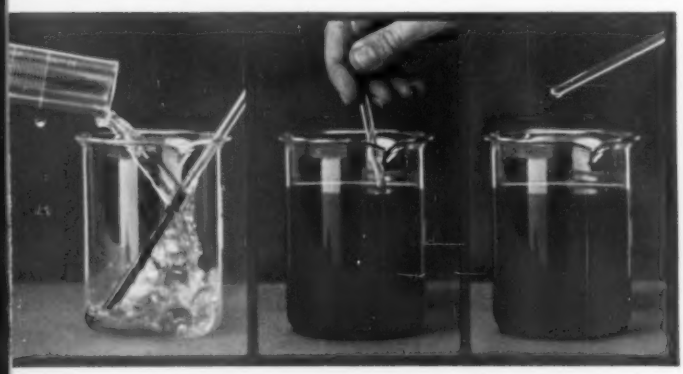
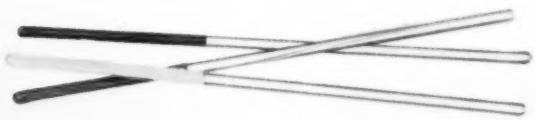
Redispersibility is one more working advantage developed through our continuing quality-improvement program. It's another big reason why uniform, fine-particle Carbanthrene Vat Dyes are truly second to none.

Ask a National Aniline representative for samples of the colors you use regularly.





Double pastes of Carbanthrene Blue BCF, Red FBB and Yellow PG were dried on stirring rods. When tap-water was poured over them, all three rods were clean in a matter of seconds. Almost immediately, the dried pastes had completely redispersed.

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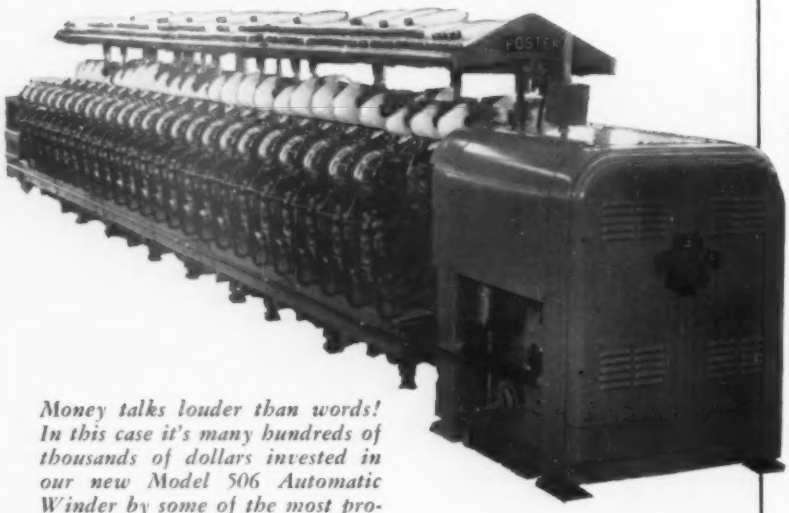
FOSTER 500 SERIES
AUTOMATIC CONE WINDER



Money talks louder than words! In this case it's many hundreds of thousands of dollars invested in our new Model 506 Automatic Winder by some of the most progressive mills in the country. We ask for no better endorsement. Do you?

Some of the mills who are now using it or have placed orders for it.

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Corriher Mills
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A. M. Smyre Manufacturing Co.
Ranlo, N. C.

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Alexander City, Ala.

Swift Spinning Mills
Columbus, Ga.

Flagg Utica Mills
Grantville, Ga.

Spray Cotton Mills
Spray, N. C.

Firestone Synthetic Fibers Co.*
Hopewell, Va.

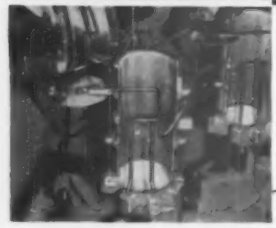
E. I. Dupont de Nemours & Co.*
Seaford, Md.

*These companies have ordered our Model 510 — another version of the 500 series.

50% MORE PRODUCTION PER OPERATOR AT TWICE THE WINDING SPEED WITHOUT JEOPARDIZING YARN QUALITY –

ELECTRONIC TENSION AND SLUB CATCHER

AUTOMATIC SIZE STOP MECHANISM



AUTOMATIC SUPPLY BOBBIN EXCHANGER

— that's why these mills have ordered. They want more production at lower cost, but they cannot afford it at the expense of yarn quality. The Model 506 *protects* yarn quality because it does not attempt to tie knots automatically. The operator does it with a standard high speed knotter and has an opportunity to test the knot at the same time (taking a small fraction of a minute). Thus any chance of wild yarn, tangles, bobbin rings, crossed ends, uneven package density or rough yarn (which can occur with automatic knot tying) is eliminated.

AUTOMATION is confined to threading up, slubbing, cleaning, disposal of empty bobbins, gauging full cones, donning full bobbins and doffing empty bobbins. None of these operations can jeopardize yarn quality.

CONE QUALITY is even better than that of the Model 102 cone (standard for the sales yarn market for many years).

HAVE YOU INVESTIGATED our Model 506 Automatic Yarn Winder? If not, why delay? Send for our Model 506 brochure.

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Westfield, Massachusetts, U. S. A.

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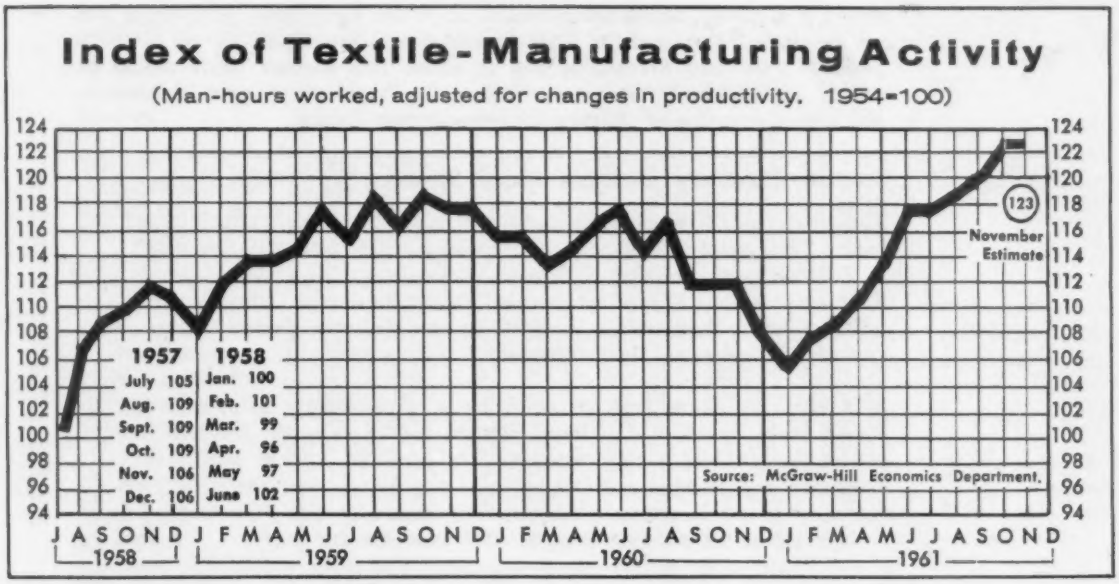

Textile Output Soars

More than fulfilling high hopes of a month ago, TEXTILE WORLD's exclusive Index of Textile Manufacturing Activity climbed a whopping 3 points in October to 123. This sets a new all-time high for the second month in a row.

The rise came on the strength of increased employment and a substantially lengthened average work week in the textile industry. In addition to the continuing rise in production, manufacturers' sales also rose. In September, latest month available, sales totaled $1.27-billion, 6% higher than the same month last year.

It now seems reasonable to ask if further gains can be expected. The answer: maybe not next month, but soon for sure. One harbinger is the improved tone in retail sales across the country even after allowance is made for a seasonal upturn shortly before St. Nick's sleigh is scheduled to start its annual run. Commerce Department reported total retail sales of $18.6-billion in October, up from $18.1-billion a month earlier. But cheering as the news is, it cannot erase the fact that the cumulative total of retail sales for the first 10 months of this year lagged 1.4% behind the total for the same period of 1960.

A key factor in the improved outlook for retail sales is the expected rise in consumer income. A 6% increase between the fourth quarter of this year and the same quarter of next year is likely. Also steady monthly increases are expected. Rising incomes accompanied by a mopping up of unemployment should go a long way toward restoring consumer confidence.

Figures of the Month

TEXTILE-INDUSTRY INDICATORS

	Latest Month	Previous Month†	Year Ago
TEXTILE WORLD'S Exclusive Index (chart above)	123	120	112
Employment (thousands)[1]	892.3	891.0	900.1
Production Workers (thousands)[1]	805.0	804.0	813.2
Weekly Earnings (dollars)[1]	67.98	66.26	62.47
Hourly Earnings (dollars)[1]	1.65	1.64	1.61
Weekly Hours Worked[1]	41.2	40.4	38.8
Production Index (1957=100)[2]	115	117	104
Wholesale Price Index (1947-49=100)[3]	94.7	94.4	95.8
Manufacturers' Sales (billion $)[2]	1.27*	1.23	1.20
Manufacturers' Inventories (billion $)[2]	2.74*	2.74	2.64
Inventory-to-Sales Ratio	2.16*	2.23	2.20
Exports (million $)[2]	100.5*	144.6	79.7
Imports (million $)[2]	98.4*	121.6	100.9
Stock Price Index (1941-43=100)[4]	30.66	30.85	25.35
Failures[5]	2	5	4

NATIONAL ECONOMIC INDICATORS

Industrial Production (1957=100)[2]	113	112	106
Consumer Price Index (1947-49=100)[1]	128.5	128.3	127.3
Wholesale Price Index (1947-49=100)[1]	118.7	118.8	119.6
Civilian Population (millions)[6]	181.6	181.4	179.0
Unemployment (millions)[6]	4.8	4.8	4.4
Employment (millions)[6]	66.7	66.3	66.4
Personal Income (billion $)[3]‡	425.0	421.1	406.4

* September, otherwise latest month is October. † Revised.

‡ Annual Rate.

1. Bureau of Labor Statistics; 2. Federal Reserve Board; 3. Department of Commerce; 4. Standard & Poors; 5. Dun & Bradstreet; 6. Bureau of the Census.

NEWS and COMMENT . . . . . .

President Kennedy, acting under Section 22 of the Agricultural Adjustment Act, on November 21 ordered the Tariff Commission to investigate imports of cotton products from yarn to clothing and to advise him whether tariffs should be raised. Textile industry spokesmen praised the President's move as a favorable step toward removing or offsetting the cotton-export subsidy.

Textile Recovery Gathers More Speed

Though earnings of many textile companies in the first three quarters lagged well behind 1960 figures, the third quarter shows a strong pickup (facing page). . . . **D. F. McCullough,** president, Collins & Aikman, says, "We would be disappointed if we could not do $77-million in sales" in the fiscal year ending March 3 (*vs.* $65.3-million in fiscal 1961). . . . **J. M. Reeves,** chairman, Reeves Brothers, Inc., says advance orders are "up substantially."

Bibb Mfg. Co. plants now are operating at a satisfactory level, according to **Robert Train,** president. . . . Inventories are low all along the line from mill to retailer, says **Robert Amory,** executive vice president, Springs Mills, Inc. . . . Shipments in September and October were "up 19.6% over the same period a year ago," says **J. L. Lanier,** president, West Point Mfg. Co. "Our unfilled order position at the present time is about 55% over the low point . . . in January 1961. Profits in the current quarter are expected to be up about 15% over . . . the same period a year ago," Mr. Lanier says.

SPOT NEWS—Senator Pastore says his Senate subcommittee will hold hearings soon after January to determine progress in effecting President Kennedy's 7-point textile-aid program, announced last May. . . . **Cotton exports** in September totaled 40.5-million square yards ($10.4-million value) *vs.* 43.8-million square yards ($10.8-million value) a year earlier and 28.8-million square yards (value $8.3-million) in August 1961. . . . **R. Dave Hall,** ACMI president, says heavy internal competition in thread means every thread import must be challenged.

Briefs from Overseas

Madrid—Institute Nacional de Industria (INI) state agency is putting up a $30-million, 75,000-spindle cotton textile plant in Malaga, easily accessible to cotton from Egypt, says TEXTILE WORLD's Dominick Curcio. Plant will cost $30-million, $7-million being provided by private foreign investors. Aim: domestic markets, plus heavy exports. . . .

London—Fine Spinners & Doublers Ltd. may set up mills in cheap-labor countries because of British government's failure to protect home producers, reports TW's Nick Landon. . . .

Tokyo—Suzuki Weaving Machine Co. will deliver 600 looms to Indonesia by end of 1961 and another 3,000 by March 1963, says John Yamaguchi, TW's Tokyo newsman. Indonesia, with an 8-yr. plan for textile self-sufficiency, now produces little more than half of its total need of 905-million square meters of cloth per year . . . **London**—British Northrup Ltd. has sold over 2,000 looms to United Arab Republic for four new mills, part of Egypt's development plan for cotton textiles, says TW's Nick Landon. . . .

Bonn—To curb low-quality imports, West Germany may soon require identification of all woolens by country of origin and percentage of wool content, says TW's Jim Morrison. Morrison also reports Belgian spinners are up in arms over an agreement whereby Hungary will trade consumer goods, mostly textiles, for $5-million of Belgian-made railway rolling stock.

Company Earnings

Company	Period	Sales ($1,000's)	Change From Year Ago	Earnings ($1,000's)	Change From Year Ago
American & Efird	Hlf. to 10/1	$24,011	+17.2%	$393	+14.7%
Beaunit Mills	Qu. to 9/30	32,176	+13.4%	1,325	+46.2%
Beaunit Mills	Hlf. to 9/30	56,931	+4.7%	2,033	+5.1%
Belding Heminway	Qu. to 9/30	11,092	+30.0%	183	+18.8%
Belding Heminway	9 mo. to 9/30	31,749	+23.8%	508	−13.9%
Berkshire Hathaway	Yr. to 9/30	47,722	−23.8%	(393)*	—
Bibb Mfg. Co.	Yr. to 8/31	73,692	−8.3%	2,501	−19.7%
Bigelow-Sanford	Qu. to 9/30	18,304	+14.4%	248	+1.7%
Bigelow-Sanford	9 mo. to 9/30	58,457	+9.1%	1,151	−8.7%
Burlington Industries	Yr. to 9/30	866,005	−5.1%	23,274	−34.2%
Chadbourn Gotham	Qu. to 10/21	10,736	−1.5%	859	+30.2%
Cluett, Peabody	Qu. to 9/30	35,349	+26.1%	1,410	+36.7%
Cluett, Peabody	9 mo. to 9/30	92,074	+17.8%	3,499	+15.1%
Cone Mills	9 mo. to 9/30	162,040	+8.7%	1,880	−50.1%
Dan River	9 mo. to 9/30	110,057	−8.3%	3,364	−35.6%
Erwin Mills	Yr. to 9/30	67,697	−5.9%	1,924	−8.1%
Firth Carpet	9 mo. to 9/30	14,858	−10.8%	(1,552)*	—
Kayser-Roth	Qu. to 9/30	33,709	+25.8%	1,055	+22.3%
M. Lowenstein	Qu. to 9/30	103,365	+2.3%	447	−41.9%
M. Lowenstein	9 mo. to 9/30	329,301	−4.0%	1,410	−69.6%
McGregor-Doniger	9 mo. to 9/30	39,044	−2.9%	967	−3.0%
Mohasco Industries	Qu. to 9/30	21,499	−4.9%	390	−27.4%
Mohasco Industries	9 mo. to 9/30	66,362	−9.0%	1,330	−41.1%
Mt. Vernon Mills	Qu. to 9/30	8,557	−2.7%	(24)*	—
Mt. Vernon Mills	9 mo. to 9/30	25,615	−11.0%	221	−69.1%
Munsingwear	9 mo. to 9/30	34,740	+2.7%	928	−17.6%
Reeves Bros.	Qu. to 9/30	14,418	+11.7%	127	+109.2%
Riegel Textile	Yr. to 9/30	85,691	−5.6%	1,503	−36.2%
Roxbury Carpet	9 mo. to 9/30	11,024	−4.6%	(141)*	—
United Elastic	9 mo. to 9/30	23,300	+0.9%	1,684	+0.7%
United Merchants & Mfrs.	Qu. to 9/30	n.a.	—	2,216	+37.1%
Wayne Knitting Mills	9 mo. to 9/30	8,806	−5.1%	538	+11.4%
American Cyanamid	Qu. to 9/30	146,606	+7.2%	11,098	+26.6%
American Cyanamid	9 mo. to 9/30	447,513	+1.3%	34,829	−5.9%
American Viscose	Qu. to 9/30	54,794	+13.2%	2,443	+361.8%
American Viscose	9 mo. to 9/30	155,951	−0.4%	5,788	+36.2%
Bemis Bro. Bag	Qu. to 9/30	35,608	+8.8%	348	−48.2%
Bemis Bro. Bag	9 mo. to 9/30	101,540	+2.5%	1,460	−33.7%
Celanese Corp.	Qu. to 9/30	73,369	+13.8%	5,111	+12.5%
Celanese Corp.	9 mo. to 9/30	206,885	+2.4%	13,732	−6.1%
Courtaulds Ltd.	Hlf. to 9/30	233,660	+4.9%	11,390	−18.5%
Crompton & Knowles	Qu. to 9/30	7,404	+10.5%	420	+15.1%
Crompton & Knowles	9 mo. to 9/30	24,022	+13.3%	1,914	+11.0%
Maremount	9 mo. to 9/30	51,258	−3.0%	2,587	+38.5%
Midland-Ross	9 mo. to 9/30	99,337	n.a.	3,335	n.a.
Mill Factors	Qu. to 9/30	62,229	+12.3%	135	+19.4%
Mill Factors	9 mo. to 9/30	189,755	+11.1%	426	+24.2%
National Starch & Chem.	Qu. to 9/30	15,870	+6.0%	947	+16.3%
National Starch & Chem.	9 mo. to 9/30	48,629	+6.5%	2,115	+0.5%
Owens-Corning Fiberglas	9 mo. to 9/30	163,202	+0.6%	9,622	−17.2%
Rohm & Haas	Qu. to 9/30	53,196	+1.1%	4,647	−1.1%
Rohm & Haas	9 mo. to 9/30	163,736	−2.9%	14,396	−15.3%
Warner & Swasey	9 mo. to 9/30	40,661	−8.3%	2,250	+2.3%
Wyandotte Chemicals	Qu. to 9/30	28,447	+4.8%	1,633	+1.8%
Wyandotte Chemicals	9 mo. to 9/30	75,170	+1.9%	3,350	−7.4%

*( ) = Loss

Washington Outlook . . .

By the time you have this in hand, the Internal Revenue Service (IRS) probably will have issued its instructions showing textile manufacturers where and how to apply the new Bulletin F in depreciation write-offs. If it hasn't, you can expect the instructions in a few days.

The liberalized rates will affect year-end statements, and many companies are waiting to tell stockholders to what extent the new rates will brighten their company's outlook.

Most of the material expected from IRS is illustrative—detailed examples to show companies precisely how they can take the shorter useful lives on both new and existing equipment. There are many complex factors that vary according to the depreciation method a company follows—straight line, double declining balance, or sum of the digits.

IRS is also expected to lay down guidelines for application of the shorter useful lives to equipment not specifically included in the original Treasury list.

Main beneficiaries of the Administration policy are, of course, cotton textile manufacturers. They've been battling to get this type of depreciation ruling.

Manufacturers of man-made-fiber fabrics—who all along have had, for instance, a 16-yr. useful life on looms—would like to get the same kind of percentage reduction. Obviously, they face tougher sledding, because they've been beneficiaries of relatively liberal IRS allowances practically from infancy.

Similarly, producers of man-made fibers would like faster write-offs. But again, opportunities for substantial liberalization are not bright.

•

The Administration is preparing a sweeping plan for a freer trade policy with the idea of eventually drawing the United States into an Atlantic Trade Community with the European Common Market. The textile industry may not be drawn into the clash early. Administration officials say there will be certain "exceptional cases" that merit special treatment. Actually, the Administration feels that cotton-cloth textiles will be well taken care of in the short-term Geneva agreement, and a long-term Geneva arrangement to permit more orderly cotton-cloth trade is well along.

•

Hong Kong has finally come into the fold under the Geneva agreement. The United States is preparing a list of products within the 64 categories agreed to at Geneva for presentation to Hong Kong and the United Kingdom for holding back exports to the United States next year. This move may calm the Japanese, who have watched Hong Kong take more and more of their stake in the U. S. market.

Government negotiators have a warning—the restrictions can work both ways. The example given is Canada. Last year, the United States exported some 440-million square yards of textiles and Canada took nearly half of it, 200-million square yards. Canada could very well ask the United States next year to cut back cotton-cloth exports under the Geneva plan and there would be no choice but to comply.

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Sonoco Dytex® Tubes for package dyeing and bleaching...

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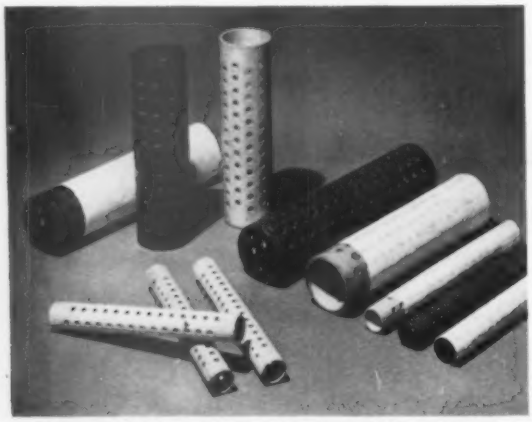
Economical Sonoco Dytex Tubes are made to save you money. When used with Plastavon Sleeves, they provide the perfect one-time combination for package dyeing and bleaching. They have proven their value throughout the years.



Plastavon Sleeves can be purchased separately or attached to the tubes. Pre-cut filter paper sheets and sleeves are also available in various sizes.

The Plastavon Sleeve permits even dye distribution, better "flow" control, and filters out objectionable or discoloring matter. The sleeve also aids in the drying process.

Sonoco Dytex Tubes are available in three grades — "C," "B" and "L" which designate the type and degree of impregnation. The Dytex "L" was designed for those who prefer a light, natural-colored tube. Standard sizes are $\frac{5}{8}$" and $1\frac{5}{8}$" I.D., 6" to $6\frac{15}{16}$" long. Special sizes made to customer order. Surfaces can be smooth or embossed.

For visible identification, solid colored tubes may be used. Tubes with colored end rings may also be ordered in black, red, orange, green, blue, yellow or brown.

Continuous product development is an advantage when you buy from Sonoco. *Only Sonoco,* in its field, provides the research and integrated manufacturing facilities required to better serve the textile industry. *You can profit from Sonoco's more than 60 years' experience!*

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Heller factoring has the effect of increasing your working capital without diluting your control or hampering your action. Too, your Heller plan cuts out management's preoccupation with non-productive credit, collection and accounts receivable routine work. This frees management for more selling, more field work, more design and research, or any other project necessary for expansion and profit. In most companies, this is the only way such activity can be generated.

Back of this increased activity is your Heller representative—in step with your plans, able to help make your tailored Heller plan do what you want.

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Over one billion dollars annually for industry

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FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 27

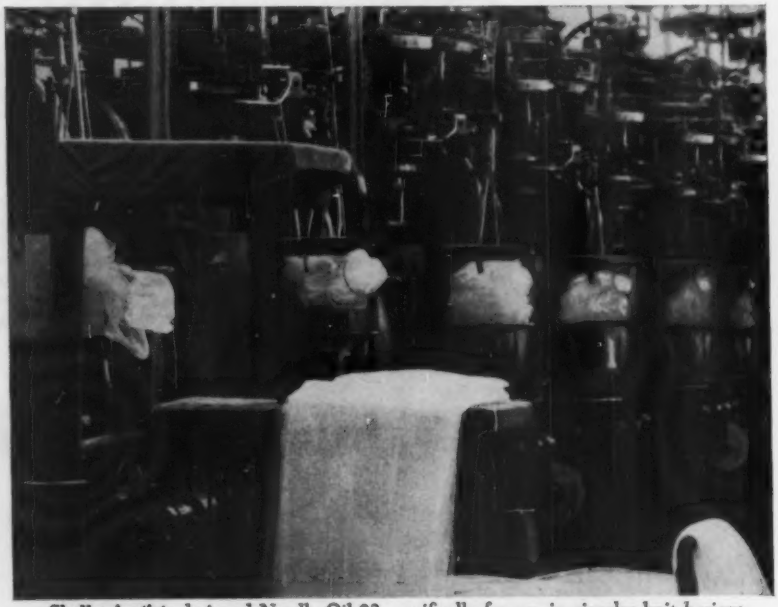
RUST:

Shell Needle Oil 23, with special Shell rust inhibitor, gives outstanding protection against rust during both operating and shutdown periods

Shell Needle Oil 23 was designed specifically for lubricating needles on circular knit hosiery machines.

It provides improved protection against rust. And it helps prevent deposition of nylon size and spin finish.

Here's how Shell Needle Oil 23 can help you cut equipment maintenance costs and increase production in your mill.



Shell scientists designed Needle Oil 23 specifically for use in circular knit hosiery machines like these. It protects needles during both operating and shutdown periods.

PROPER protection of needles from rust is a specific function of the lubricant—during both operating and shutdown periods.

Shell scientists have designed this type of thorough protection into Needle Oil 23 with a special rust inhibitor.

Needle protection assured

Humidity cabinet tests, using several commercial oils, prove that amazing rust-inhibited Shell Needle Oil 23 gives *as much as 200 per cent longer protection against rust than the other needle oils tested.*

It helps to maintain the highly polished surfaces of needles, narrowing points, lace points and carriers during both operating and shutdown periods.

Three more outstanding features

Here are three more outstanding features of this remarkable oil. They can help you cut maintenance costs and increase production in your mill.

1. Excellent scourability. Shell Needle Oil 23 is specially formulated to provide excellent scourability.

It drastically reduces yarn size and spin finish accumulation. This can lengthen the interval between machine cleanings.

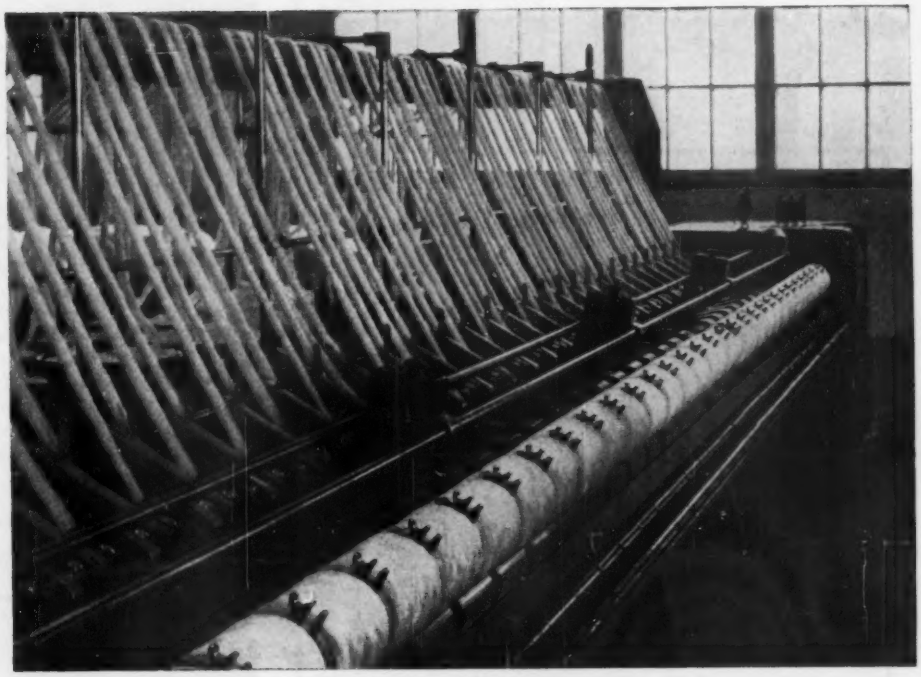
2. Excellent stability. Shell Needle Oil 23 virtually eliminates the problems of oxidation, gum formation, metallic soap deposits and sluggish machine starts.

3. Low surface tension. The low surface tension of Shell Needle Oil 23 gives it increased wetting and lubrication properties.

For complete facts on Shell Needle Oil 23, see your Shell Industrial Products Representative. Or write: Shell Oil Company, 50 West 50th Street, New York 20, N. Y.

SHELL

A Bulletin from Shell
—where 1997 scientists are working to provide better products for industry



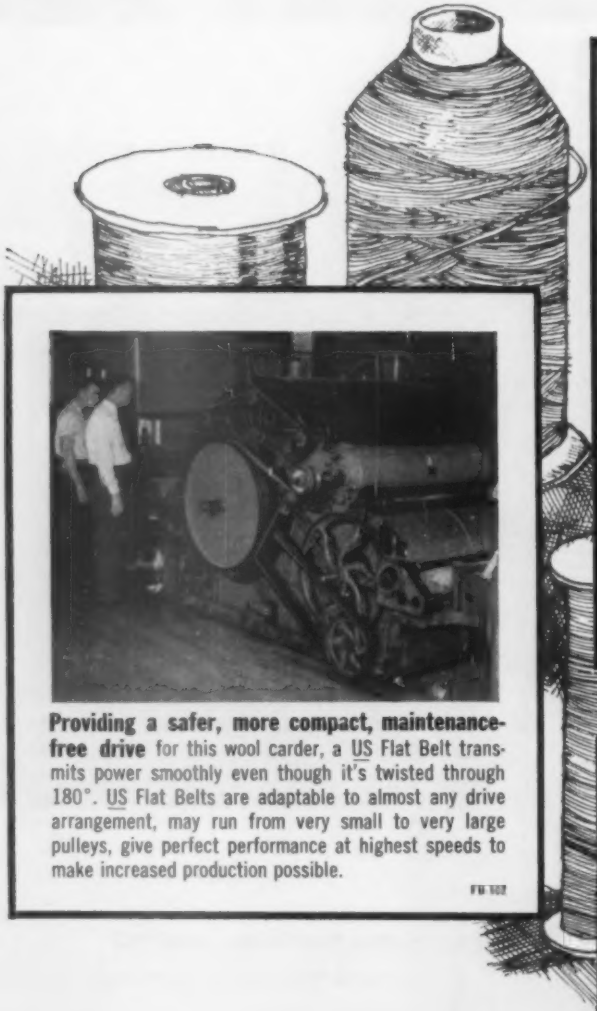
High Draft Finisher, model KSD
4 to 20 heads with 2 bobbins each
Double sliver
Delivery speed up to 50 m/min. (164 ft./min.)
Draft 10 to 28
Ratch adjustable by hand crank

Capitalize on our experiences gathered in the course of many years.
Our experts will be glad to advise you on the planning and modernization of complete spinning mills for cotton, worsted, staple and man-made fibres.

INGOLSTADT DEUTSCHER SPINNEREIMASCHINENBAU INGOLSTADT

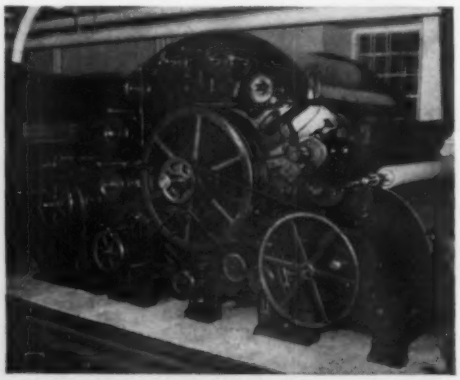
FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 29

AT THE HEART OF THE TEXTILE INDUSTRY



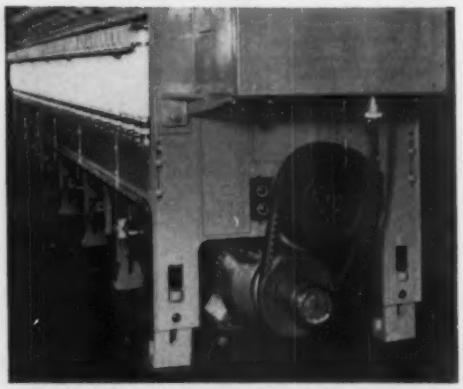
Providing a safer, more compact, maintenance-free drive for this wool carder, a US Flat Belt transmits power smoothly even though it's twisted through 180°. US Flat Belts are adaptable to almost any drive arrangement, may run from very small to very large pulleys, give perfect performance at highest speeds to make increased production possible.

FB-102



Providing perfect synchronization for this maze of rollers on the full roller of a wool carder, U. S. Royal V-Belts keep all parts of this machine going at the exact speed required, deliver top performance at many different rotational speeds. These V-belts have excellent length stability, require no maintenance, eliminate many metal parts.

VB 113



Keeping spinning frames like this one running smoothly and cleanly, U. S. Royal Variable Speed Belts are known for the long wear and dependable, maintenance-free service they give. These quiet-running, non-squashing, non-sagging belts have proved in textile plants everywhere that they consistently outperform all other belts.

VSB 154

Wherever you hear the hum of textile equipment, you'll find US Industrial Rubber Products helping to make production more efficient . . . more profitable. US is not only aware of the textile industry's needs, but has the products to serve them most effectively.

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

United States Rubber

MECHANICAL GOODS DIVISION

Rockefeller Center, New York 20, N.Y.

RS

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REUTLINGEN/WUERTTEMBERG—GERMANY

We would ask you to write, if you are interested in further technical details.

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Textube Corporation, 695 Summer Str., Stamford, Conn.

SUB-AGENTS FOR THE SOUTH
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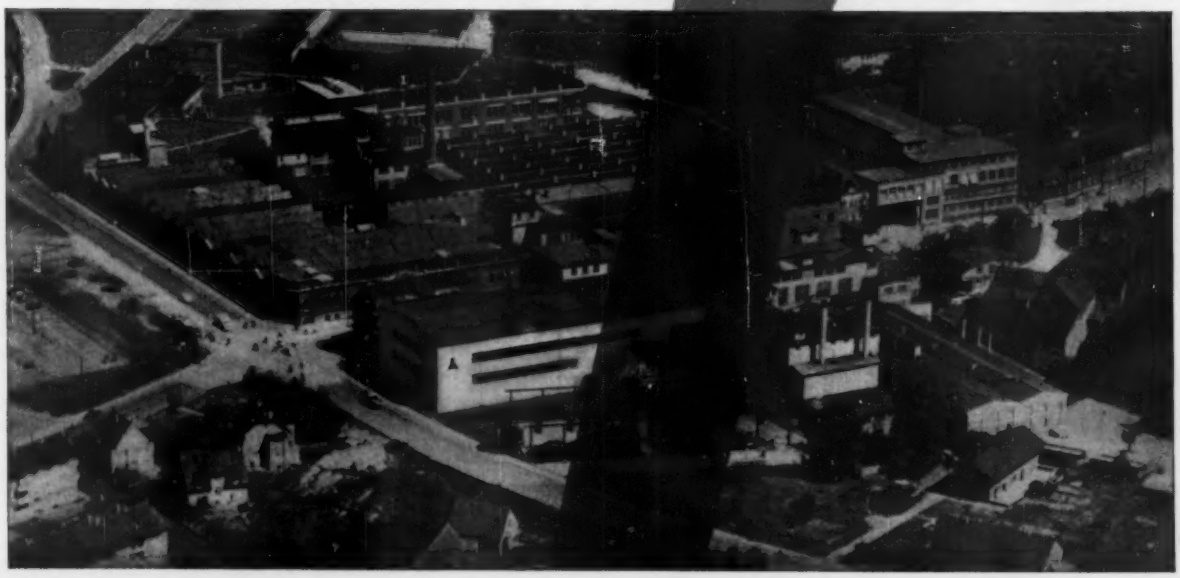
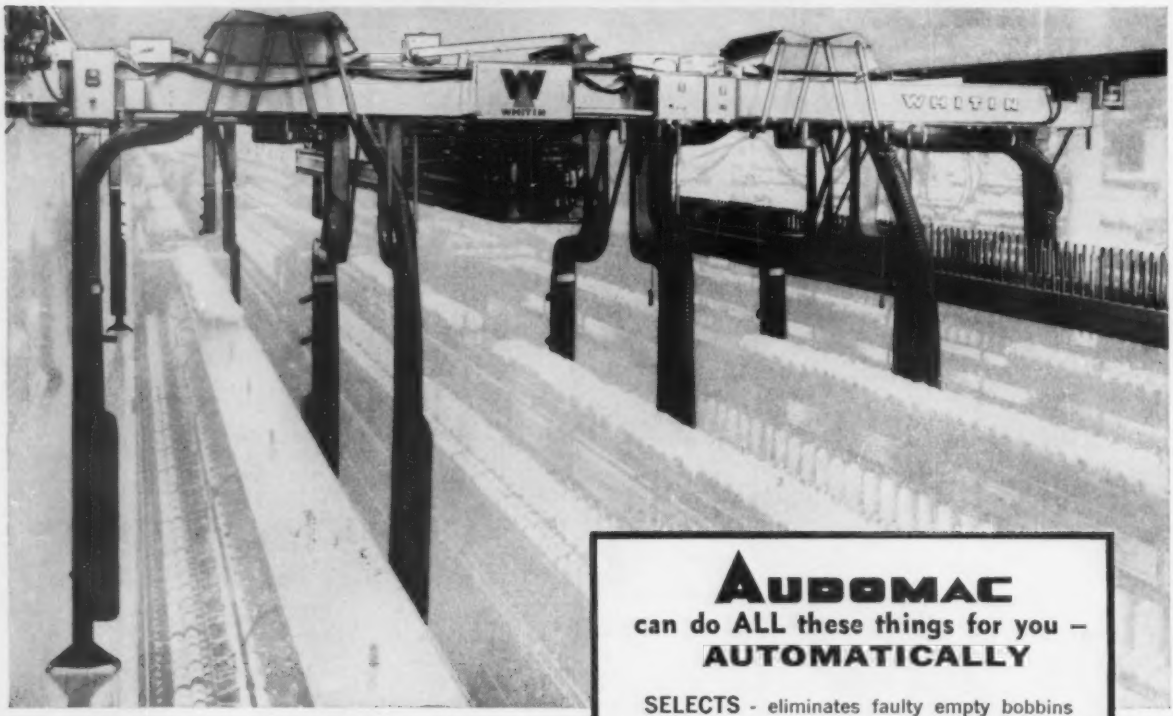


FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 31

W . . . More than just a doffer and only WHITIN has it!

AUDOMAC



The AUDOMAC is far more than just an "automatic doffer" — it is a complete bobbin handling system — a system tested through the doffing of over 5,000,000 bobbins in actual mill operation — a system destined to play a major role in shaping the spinning mill practices of the future.

The AUDOMAC Doffer System in months of 144-hour-per-week actual mill operation has dramatically demonstrated its capacity to *increase overall spinning room efficiency by:*

- **Increasing yarn production**
- **Reducing direct labor costs**
- **Providing for improved quality control**
- **Establishing basis for extended materials handling systems**
- **Reducing cost of personnel training**

Call your Whitin representative today about the AUDOMAC . . . only Whitin has it!

(Manufactured and marketed exclusively by Whitin in the United States under license from Deering Milliken Research Corporation.)

AUDOMAC
can do ALL these things for you — AUTOMATICALLY

SELECTS - eliminates faulty empty bobbins

LOADS - frame load of empty bobbins constantly available

TRANSPORTS - bobbins carried, in sequence, at frame signal, to and from spinning frame and to subsequent processes

DOFFS - complete frame of any length doffed in two minutes downtime — 6 to 15 doffs per hour — with less yarn damage

DONS - averages fewer ends down than manual doffing

MONITORS - provides for better quality control by holding bobbin sequence

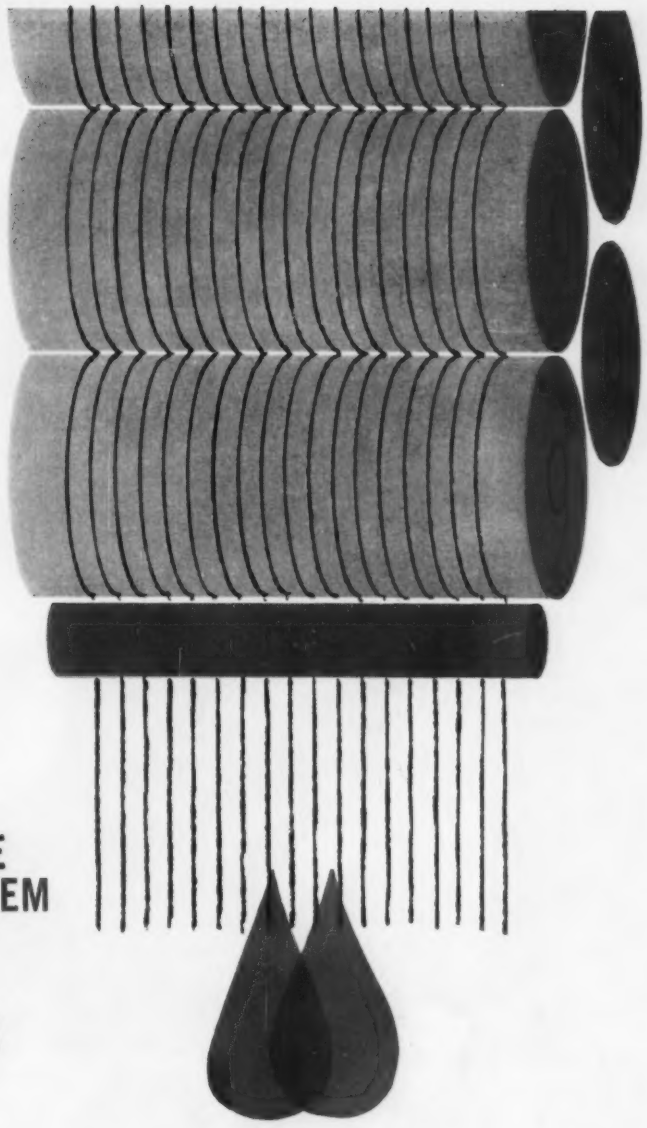
CLEANS - performs superior frame, floor and ceiling cleaning during doffing cycle

WHITIN MACHINE WORKS

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

The best way to better yarns



NEW MOISTURE CONTROL SYSTEM GIVES EXTRA-FAST RESPONSE FOR HIGH-SPEED SLASHERS

The new Honeywell *Moist-O-Graph IV* Control System delivers the extra-fast response needed to effectively measure and control regain of yarn on today's high-speed slashers.

Heart of the system's fast response is the new DPP (*Deviation Proportional Pulse*) Control Unit. By employing a new correcting technique, the DPP unit overcomes the production problems usually encountered with high-speed slashers equipped with conventional moisture control units.

In conventional systems, when the moisture deviates from the desired value, the control unit sends a correcting pulse of a fixed duration to the motor controlling the speed of the slasher. If, after a preset interval, the moisture content has not returned to this desired value, another correcting pulse—still of a fixed duration—is sent. This is repeated until the desired regain is reestablished. On high-speed slashers this means that a lot of yarn races through the machine before the control unit can effect the proper regain.

With the DPP unit in the *Moist-O-Graph IV* system, correcting pulse signals to the motor are of a *duration directly proportional to the magnitude of the deviation* from the desired moisture content. The control unit quickly adjusts the slasher speed before any appreciable amount of yarn goes by. The desired per cent regain is held for practically the entire run.

For specific details on how the new *Moist-O-Graph IV* Control System can improve *your* high-speed slasher operation, contact your nearby Honeywell textile field engineer. He'll be glad to examine your production requirements, make detailed recommendations, and provide supervision for the complete control installation to ensure optimum performance. MINNEAPOLIS-HONEYWELL, Wayne and Windrim Aves., Phila. 44, Pa. In Canada, Honeywell Controls, Ltd., Toronto 17, Ontario.

Honeywell

H First in Control SINCE 1906

HONEYWELL INTERNATIONAL Sales and Service offices in principal cities of the world. Manufacturing in United States, United Kingdom, Canada, Netherlands, Germany, France, Japan

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 33

He knows all the right combinations

Using coatings and laminations, Union-Camp's Bob Harris has given corrugated boxes a host of amazing new properties.

OUR photograph shows Bob Harris standing in a forest of containerboard stock, paper and laminating materials. Here, he is comfortably at home.

He should be. Bob is a chemist, and a Project Supervisor at Union-Camp's Product Development Laboratory. Coatings and laminations are his specialty. Guesswork plays no part in his research.

"Today, thanks to coatings and laminations, there are few limitations on what you can package in corrugated," says Bob. "Using them singly or in combination, we can give corrugated boxes any number of protective properties. Water repellency, for example. Or snag and scuff resistance. Or resistance to acids and grease.

"We can coat the inside of a box so that it won't scratch the finish of an expensive hi-fi set. We can create moisture barriers for packaging soaps and other types of products.

"Everything we do is aimed at making the package more efficient by providing increased protection and reducing costly damage."

Recently, Bob and his group perfected a special *release* coating which is applied directly to the box. It prevents materials such as rubber or asphalt from sticking to the interior surface of corrugated boxes.

Bob Harris has also worked some minor miracles in improving the *printing* surface of Union-Camp containerboard. Using a special clay coating and resinous binder, an extremely smooth surface is provided that takes printing beautifully. The clean, sharp impressions that can now be achieved enhance the display value of the box and the sales appeal of its contents.

What lies ahead for corrugated combinations?

Bob and the rest of Union-Camp's development team are hard at work investigating new coatings that will result in even greater protection and economy for Union-Camp customers. This work is being carried on in a laboratory that can duplicate any shipping hazard a box is likely to meet in actual use. Its facilities include special *environmental rooms* that can simulate the heat, cold, or moisture conditions found anywhere on earth.

Find out what improvements Bob can make in *your* box. While you're about it, investigate Union-Camp's *complete* Packaging Evaluation Program available at no additional cost.

This service includes box design and development, specifications control, graphic design and merchandising counsel, box testing and in-plant surveys of your materials handling operation. An improvement in any one of these areas might produce greater efficiency and economy in your corrugated packaging operation.

A note on your letterhead will bring a prompt response. Why not write us today?

UNION-CAMP®

CORRUGATED BOXES

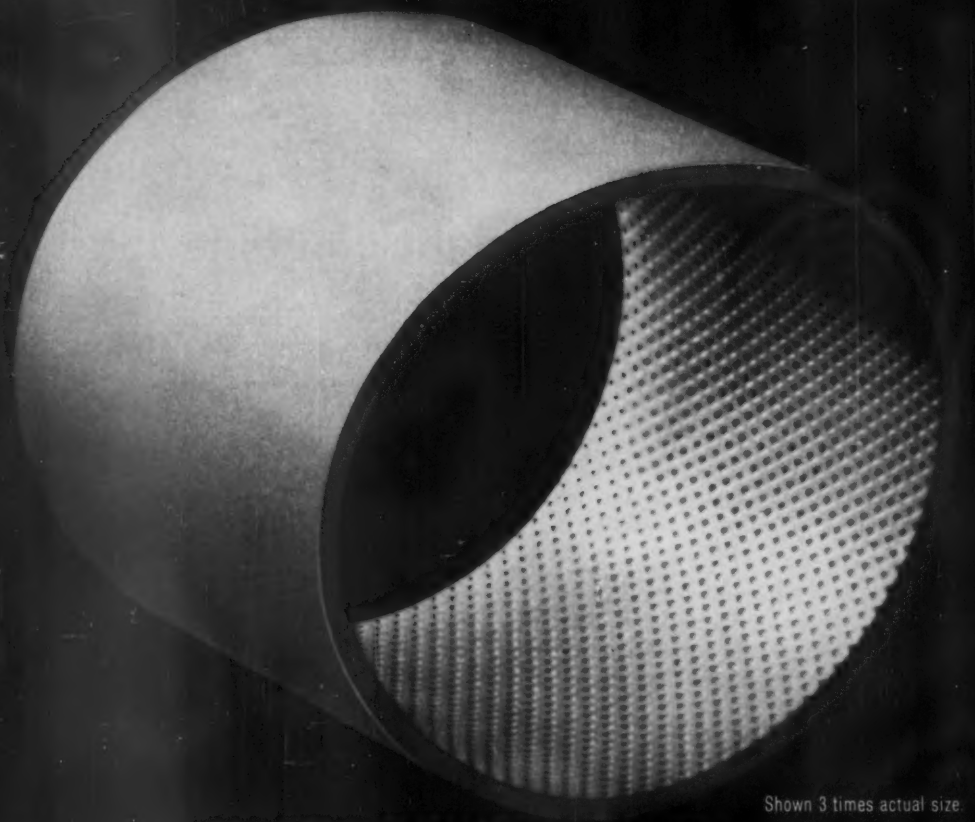
Union Bag-Camp Paper Corporation · 233 Broadway N.Y. 7, N.Y.

Plants:

*Dedham, Mass.; Allied Container Corp., Route 128, Allied Drive
Trenton, New Jersey; 1400 E. State St.
†Washington, Penna.; P. O. Box 285
†Cleveland, Ohio; 10200 Miles Ave.
†Sharonville, Ohio; P. O. Box 86
Chicago, Ill.; 4545 West Palmer
†Benton Harbor, Mich.; 11th St. & Britain Ave.
†Monroe, Mich.; 1109 East Elm Ave.
†Eaton Rapids, Mich.; P. O. Box 8
*Baltimore, Md.; Eastern Box Co.; Wagner's Point
Jamestown, N. C.; 3704 Point Pleasant Rd.
Spartanburg, S. C.; P. O. Box 1965
Savannah, Georgia; P. O. Box 570
Lakeland, Florida; P. O. Box 454

*Subsidiary Companies †River Raisin Division

Now every Dayco apron is better 5 ways!



Shown 3 times actual size

NEW: DAYCO PATENTED EMBOSSED APRON

1. Freedom from stress greatly reduces checking, cracking, and other wear.
2. 50% less drag, with related reduction in horsepower.
3. Self-cleaning in operation.
4. Perfect tracking, as a result of embossed "tread."
5. Helps keep quality standards high.

New embossed inner surface makes Dayco

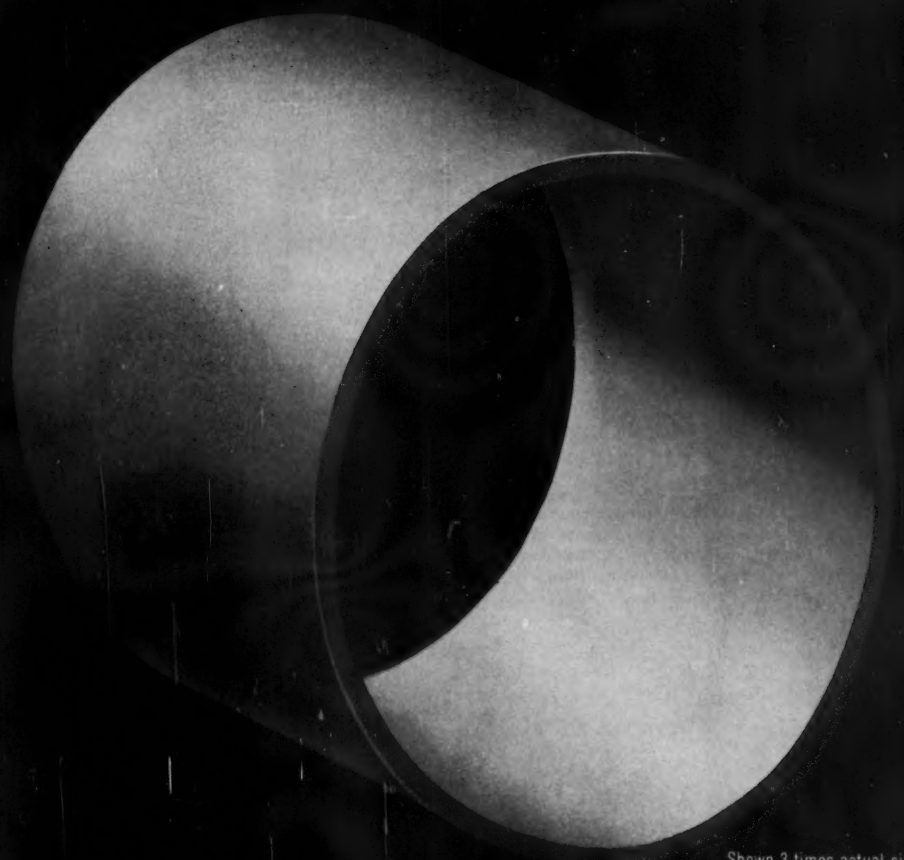
Now every apron Dayco makes is designed with a new superior embossed inner surface—for longer apron life and outstanding performance.

For many years, Dayco compounds have been steadily improved. At the same time, Dayco engineers have been concerned with reduction of stress on aprons in use. Now an entirely new embossed inner surface, exclusive with Dayco, provides that reduction. Here's the story, based on controlled tests and actual mill use.

Dayco embossed aprons have less material in contact with the nosebar, which means less compression and distortion of the apron as it turns; less checking and cracking.

Smoother tracking, with better grip and less slip, is a second plus this patented inner surface provides. There's a seeable improvement in drafting action, and evenness of yarn, too.

Each Dayco apron cleans as it runs, thanks to that special inner surface. Down-time for cleaning idler rolls and nosebars is practically eliminated. And, with only 50% of apron surface in contact with driving parts, far less horsepower is required to operate Dayco-equipped frames.



Shown 3 times actual size.

OLD: CONVENTIONAL APRON

1. Stress at nosebar leads to early wear and deterioration.
2. Full measure of drive power required.
3. Regular cleaning essential.
4. Occasional slipping and chattering.
5. Can hold down quality of yarn produced.

the most durable, efficient apron you can buy

Dayco aprons — with the same fibers on the same frames — outperform other aprons by a margin that shows up plainly in profit and production records.

Ask your Dayco representative for help in putting this outstanding new apron to work for you. For further information, write or phone Dayco Textile Products, 401 S. C. National Bank Bldg., Greenville, S. C. Overseas Plant: The Dayton Rubber Co., Ltd., Dundee, Scotland.

Other Dayco products for the textile industry—all produced with the same careful attention to satisfying your needs—include: cots, roll coverings, slasher rolls, loop pickers, drop box pickers, lug, hold-up and harness straps, bumpers and sweepsticks.

Dayco TEXTILE PRODUCTS

Division of Dayco Corporation

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 37

"Warner electric motion control saves customers time and money many ways"

. . . says the engineer in charge of research and development at Wildman-Jacquard Co., Division of Draper Corporation, Norristown, Pennsylvania.

Wildman-Jacquard Circular Knitting Machine duplicates complex stitch patterns of handwork.

Warner electric brakes, clutches, and controls combine to reduce costly press-offs, slash down-time, and improve control on Wildman-Jacquard Circular Knitting Machines.

Savings! Warner electric clutches and brakes keep time-wasting "press-offs" as short as possible—far better than any other alternate acceleration-deceleration control.

Savings! Lost production time and maintenance expense due to shock, head vibration, and gear breakage are completely eliminated with Warner electric clutches. Complex trouble-causing control linkages are a thing of the past as well.

Savings! A Warner control panel (developed jointly by Wildman-Jacquard and Warner) transmits signals from protective stop-motion devices to Warner clutches and brakes—making instant stops possible so that dropped stitches can be caught rapidly.

Savings! The "jogging" feature saves operator setup time, ends hand turning of the machine, wasted motion . . . he simply pushes a button on one of several remote stations and the Warner control panel responds.

Warner Control Panel ties in stop-motion devices on yarn changer, needle protector, and body drop-out protector. Its four potentiometers permit adjustment of Warner electric clutch action as desired.

Alert textile men are looking at controls that give them a "competitive edge." Warner "electric motion control" provides direct electric actuation, easier control, greater automaticity, and many other advantages you will need on your present and future mill equipment. Write to Warner today for full details and technical data.

WARNER ELECTRIC

WARNER ELECTRIC

Warner Electric Brake & Clutch Co., Beloit, Wisconsin

Stocked by Authorized Distributors in Principal Cities Throughout the World

Liquid or Flake...

Nacconol®

ALKYL ARYL SULFONATES

help you hold down WET PROCESSING COSTS!

NACCONOL SL is the biggest-selling liquid alkyl aryl sulfonate in the textile industry. Its cleanliness and clarity tell you why. The homogeneous liquid doesn't separate even at low temperatures and is easy to handle. It has excellent money-value, too, because of its high cleaning power per dollar!

NACCONOL NR offers double economy in a flake material. Low concentrations are extremely effective in scouring, wetting out and other processing operations. You use less! And you waste less, too, since you can accurately measure needed amounts.

NACCONOL alkyl aryl sulfonates are always uniform, produce consistent results, and are stable to pH and processing chemicals. They do not form efficiency-destroying insoluble hard-water soaps!

We'll gladly send samples of NACCONOL SL, NACCONOL NR or these other outstanding detergents for the textile industry:

NACCONOL DB Dense Beads

NACCONOL DBX Super Dense Beads

Allied Chemical

NATIONAL ANILINE DIVISION

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FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 39

What's the "plus" behind the nameplate?

OUR CUSTOMERS KNOW.

As wet finishing equipment manufacturers, we do not attempt to compete with chemical companies in "process know-how." Research and development in this specialized area is a continuing, vital activity of every progressive chemical supplier to the textile industry.

Yet no process is ever complete or successful without properly adapted equipment. Thousands of process patents lie dormant because they made demands of equipment which are mechanically or economically impractical.

Matching equipment to process requirements, however, has long been one of Rodney Hunt's strongest capabilities. For example, in continuous bleaching of cotton cloth, we designed rope bleaching ranges to match the first Becco and DuPont systems. More recently, after DuPont developed a system for rapid bleaching of heavy fabrics in open widths, we built the first pilot range which makes continuous bleaching of small lots economically feasible. Olin and Becco also use pilot bleaching ranges we have developed and built.

Today, the great majority of continuous bleaching ranges in operation throughout the world carry the Rodney Hunt nameplate.

Why do the leaders in this field turn to Rodney Hunt for new equipment design and development?

It's simply because we have accumulated over many decades the knowledge essential to investigate machine design for process innovation... because we are willing to gamble and work side by side with these companies in proving (or disproving) a new idea.

And when the process is proved in full scale production, we know the equipment inside out. We know what it can do... and more importantly... what it *cannot* do.

All this works to your benefit. When you install Rodney Hunt equipment for your new processes, you know you're getting equipment as free of "bugs" and headaches as it is humanly possible to obtain. You don't have to struggle making the equipment perform to specifications. Nor waste time and money in makeshift changes.

This is a provocative thought too when in the market for "run of the mill" equipment. The "cost" is *less* in the long run.

If you'd like your equipment to come complete with this "plus" behind the nameplate, we will be delighted to have the opportunity to talk with you.

Rodney Hunt Machine Co.

RODNEY HUNT

TEXTILE MACHINERY DIVISION | 66 Mill Street, Orange, Massachusetts

Sales Agents • In the South – Hayes Textiles Company, Inc., Spartanburg, So. Carolina • In Canada – W. J. Westaway Company, Ltd., Montreal, Quebec and Toronto, Ontario

Tensitrol® Washers • Bleaching Ranges and Rangettes® • Tru-Shade® Dyeing Machines • Wring-Master® Padders • Niptrol® Mangles • Special Equipment

If You Want a Crusade to Join . . .

. . . then let us suggest one. It's the crusade to right the wrong being done to the cotton textile industry by the two-price system for cotton. Under this system, as every textile man knows (but not enough businessmen, legislators, and other good citizens know), any foreign manufacturer of cotton goods can buy raw cotton in the United States for 8½¢ a pound less than an American textile producer must pay.

We think this crusade is the best one anywhere around—most deserving of wide participation, and most likely to find success. Here's why we see it that way:

• **Its aim is to right a wrong,** to wipe out an injustice. The cause is just.

• **The stakes are high.** Victory will bring dollar gains to taxpayers as well as textile companies.

• **The facts are clearcut and unambiguous**—the staggering tax bills paid by the textile industry and by taxpayers in general.

• **Already there's a good deal of support** for the crusade. In addition to support within the industry (somewhat overshadowed recently by its preoccupation with imports), there is also support in some influential quarters outside the industry—the President of the United States, *The Wall Street Journal,* and the president of the Chase Manhattan Bank, to mention only three. We believe the crusade will muster wide popular support if and when the facts are made known.

What are these facts?

James E. Robison, president of Indian Head Mills, Inc. (111 West 40th St., New York 18), recently pulled some of them together in a speech. Here are a few highlights from that speech (for a complete text, write directly to Mr. Robison):

• **King Cotton is in deep trouble,** captured by Congress and held captive for many years. A king's ransom has been demanded and paid—again and again.

• **The taxpayers' share of this ransom was $408-million** in fiscal 1961, paid out in the farm price stabilization program. In the past five years it has totaled about $2.5-billion, and it adds up to well over $4-billion since 1932.

• **The textile industry's part of this ransom has averaged about $275-million** a year for the past five years. American cotton mills have paid out this sum in buying raw cotton at controlled prices in excess of world prices. It's a sum that far exceeds total cotton-mill profits in the same period.

• **Indian Head's cotton buyer must pay 35¢ a pound** for $1\frac{1}{16}$-in. strict low middling cotton in Memphis. But any spinner in the world—France, Italy, England, Hong Kong, or Japan—can go to Memphis and buy the same strict low middling cotton for 26½¢ a pound.

• **Indian Head can buy that same type of cotton for 27¢** in Mexico. But the company cannot bring that bale into the United States and spin it in one of its own mills.

• **Indian Head recently announced the closing** of its Glendale (S.C.) mill. With cotton at 26½¢ a pound, this mill could have been kept going, even at the current market prices for cloth.

• **Elimination of the $360-million to be paid** by the cotton textile industry as export subsidy in fiscal 1962 would go a long way toward solving the industry's problems—including the import problem.

At the end of his stirring speech Mr. Robison asked three questions. Assuming the facts on King Cotton's ransom were to be noised abroad in the land, he asked:

"Would anyone listen? Would anyone care? Would anyone help?"

Well, would anyone? Would you? We'd like to know.

Help for Argument

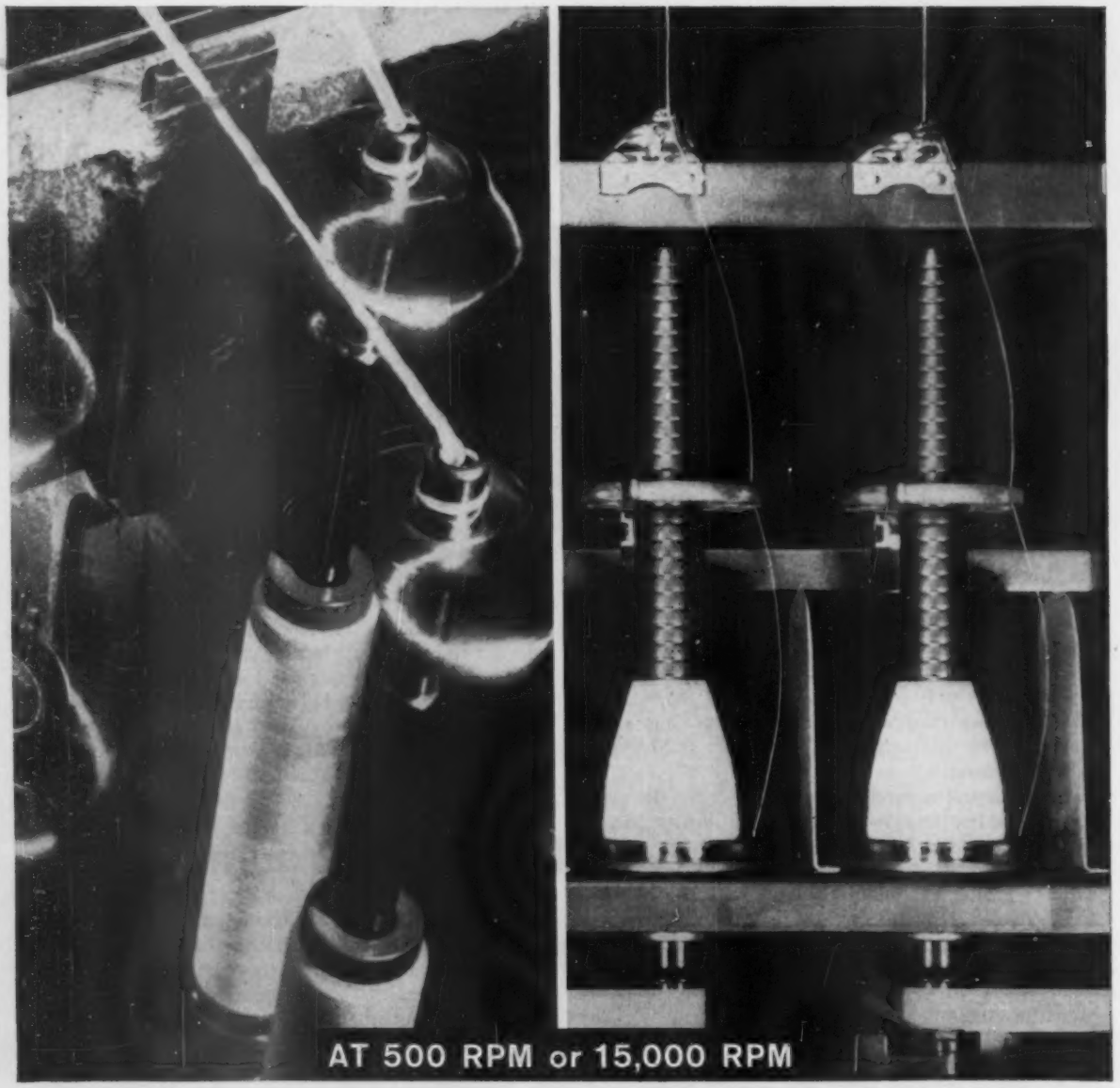
NEXT TIME you hear somebody say the textile industry is sick or ailing or obsolescent or expendable or mature, don't kick him in the teeth. Just tell him some facts revealed in the new McGraw-Hill Fall Survey of Preliminary Plans for Capital Spending:

• Capital spending in textiles in 1962 is planned at 10% above 1961—a jump from $510- to $560-million. (Actual spending may run higher, because most survey returns came in before announcement of the depreciation speed-up.) The increase planned by all manufacturing industries is just 7%. Only four industry groups will increase their capital spending at a higher rate than textiles. Eight groups will spend at a lower rate, and two will trim 1962 spending below 1961 levels.

• The textile industry expects sales (physical volume) to be 5% higher in 1962. That's only a little less than the increase expected by all manufacturing.

• In September, the industry was running at 87% of capacity *vs.* 81% for all manufacturing. Only two industries were running at a higher level; 10 at a lower. Textile operations were only 10 percentage points below the industry's preferred rate. Just four other industries were running closer to their preferred rate.

We might add that our McGraw-Hill Department of Economics has just completed a new study of the textile industry, with some forecasts. We'll be glad to send you a mimeographed copy on request.



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TEXTILE WORLD

Management Bulletin

Things you should know about . . .

One-Check Payrolls

Now you can handle your entire payroll with one check. A new service by commercial banks abolishes use of the cash-pay envelope and the pay check. Employees' pay is automatically credited to their checking accounts without charge by the bank. The bank's interest? Promising new retail business.

Tuning Your House Organ

Are you lax in making full use of your company publications? W. H. Peterson, New York University professor, warns that house organs often avoid the subject of economic education, and rarely devote space to correct the uncomplimentary image of the businessman portrayed in the public press. For some help in educating your employees, write for the National Association of Manufacturer's special kit at your nearest NAM regional office.

Textile Costing

Need some help on a cost system for production and control of gray goods? A revised edition of Professor Thomas A. Campbell Jr.'s costing book is now available from the Clemson College bookstore. Campbell is head of the college's textile management department.

What and When to Automate

You can get some pointers on analyzing machinery investment from a new 14-p. brochure. The booklet cites case histories on setting up new facilities, revising old ones, deciding what operations to automate, and analyzing investment. Write Designers for Industry, Inc., 4241 Fulton Parkway, Cleveland 9.

Hiring Your Wife

You may get your spouse tax-aided retirement income by employing her in your mill. A woman employed by a firm her husband controls may be entitled to a pension and Social Security, reports the *Wall Street Journal*. She would be taxed on the pension, but the firm's contribution would be tax free. A pitfall: paying her more than her job is worth and setting aside too much as retirement income. Revenue Service might declare the pension discriminatory.

Central Distribution of Information

Here's one company that's taken the central-distribution-of-information idea and gone it one better. Chemstrand Corp. is building a Management Information Center in Greenville, S.C. as the focal point for planning improvements in production and marketing coordination, order handling, and distribution.

". . . we deliberated for a week . . . I was greatly encouraged."

Meet Hickman Price Jr., Assistant Secretary of Commerce for Domestic Affairs. He's just back from the Geneva meeting on international trade in cotton textiles. Here for TEXTILE WORLD *readers, is his "I was there" report on the . . .*

. . . Meeting at

THE GENEVA meeting accomplished just about everything it was supposed to—setting the groundwork for negotiations leading to a long-term arrangement to carry out intelligent, orderly international trade in cotton textiles.

That's the feeling of Hickman Price Jr., Commerce Department's representative at the recent Geneva conference. He knows. He was there. And because he's new to the textile industry, he brings to textiles' familiar, troubling problems a detachment—and a fresh point of view.

If you've been reading about the Geneva meeting, maybe you've wondered about these questions:

- What did the meeting accomplish?
- What kind of timetable was set up?
- What far-lasting effects will it have?
- What impact did industry advisors have?
- Who is Hickman Price?

WHO IS PRICE?

Not too long ago, almost nobody in the textile industry knew Hickman Price. Today, he looms as one of the important men of government—a Washington bureaucrat with a big hand in textile affairs. It wasn't

". . . discussions at the plenary session were free, open, and frank."

". . . advice and counsel of the management-labor advisory committee were invaluable."

". . . no bilateral bargaining . . . no signs of dispute . . . no smoke-filled rooms at Geneva."

Geneva: One More Forward Step

always so. Until his appointment as Assistant Secretary of Commerce, the genial Mr. Price was in the automobile business, both at home and abroad (most recently as an executive with Willys and Mercedes-Benz in Brazil). But he's been getting heavy homework and briefings on textiles ever since he took office early this year. So much so that Commerce felt he was the man to head up its part of the team bound for Tokyo late last August to work out a quota agreement on textiles. And he went.

Mr. Price is known in Washington as a hard-hitting industrialist. And he looks good to most textile executives who know him.

"GREATLY ENCOURAGED"

First off, Mr. Price wants it known that he was "greatly encouraged" by developments at the first meeting of the General Agreement on Tariffs & Trade (GATT) Provisional Cotton Textile Committee. He describes the meeting as a group of nations probing to find a solution for some very complex problems. And he feels the Geneva meeting started the ball rolling toward the goal of orderly trade in an effective and cooperative way.

He points back to the July 21 agreement. This agreement set up a short-term arrangement for invoking a ceiling on textile imports during the 12 months ending December 30, 1962—the cutting off being at the level of imports in the 12-mo. period ending June 30, 1961. And, Mr. Price adds, this agreement further provided that the GATT textile committee recommend to the several nations involved a long-term arrangement to take over where the short-term agreement left off. Schedule: The study would start on October 9 and conclude by April 30, 1962.

"The October meeting in Geneva was the first step in that provision," Price says. "The meeting, however, was deferred from October 9 to October 23.

"We met and deliberated for a week, all government representatives of the long list of countries on the committee—22, including observer nations. We incorporated principles for a long-term arrangement in a document, drafted and approved by the committee as a whole."

Actually, the committee set up machinery and a schedule for future work. It established a technical subcommittee and a statistical subcommittee. The former will meet December 11 and start to hash out the major textile problems toward forming a set of "defini-

tive recommendations, operating within the guidelines provided by the principles agreed to on Oct. 27." Price says this committee will submit recommendations toward the middle of January. The other subcommittee will provide statistics to aid the technical committee.

WILL MEET DEADLINES

The over-all committee, having studied the recommendations, will then reconvene January 29 either to act on them or to modify them, Price says.

"Thus we hope, prior to the deadline of the July 21 agreement, to have adopted a long-term arrangement. Now the length of this arrangement is one of the problems subject to committee approval. The U. S. delegation recommends a 5-yr. period."

FAR-REACHING EFFECTS

Price expects the agreement to have far-reaching effects—in two ways. "Broadly speaking, we hope the long-range agreement will provide for a rationalization of the international movement of textiles, including progressive elimination of restrictions on the part of nations now restricting imports so developing nations can have greater marketing opportunities, including the possibility of exchange earnings for the sale of their products. Such progressive relaxation would also tend to lessen pressures on countries that do not have such restrictions and who are already bearing a heavy load of imports, such as the United States.

"This multilateral approach to textile problems, which started in July and is now continuing, is the first time that an attempt seriously has been made by international arrangement to reach agreement looking toward the solution of problems of both exporting and importing countries—and over a considerable period of time."

Mr. Price sums up his hopes for the long-term arrangement this way: "The solution is eminently desirable. Once it is reached as part of a long-term arrangement, it will then be possible for all participating nations to carry out intelligent, long-term planning in the textile area—both as to exports from those countries essentially exporters of goods, and as to volume of imports that importing countries, such as the United States, may be expected to carry."

PRAISE FOR INDUSTRY

An American industry advisory group accompanied the official U. S. team to the Geneva meeting. Mr. Price says: "The advice and counsel of those members of the management-labor textile advisory committee present in Geneva were, as always, invaluable.

"Since only government officials could attend these strictly governmental meetings, we held daily briefing sessions with the management-labor advisory group to bring them up to date and to seek advice.

"Other countries at Geneva had industry advisors, too. And I assume they operated the same way we did. One important plus: Our people and their's had a chance to get together and exchange information and plans for the future."

When asked if the Americans there expressed any opinions on daily sessions, Mr. Price laughed: "Yes, every day—sometimes two or three times a day. But most of the advisory group understands fully what we're trying to do. And most have done their best to cooperate with us wholeheartedly."

NO SMOKE-FILLED ROOMS

Give-and-take bargaining is the mark of many meetings. But Mr. Price says: "When you've got 22 nations around a table, you've obviously got to have a wide exchange of views. These are plenary sessions where each country presents its views. And naturally there is a great deal of discussion among delegations to reach common ground for an agreement.

"There were no smoke-filled rooms at Geneva. In fact, I doubt that you'd find a smoke-filled room anywhere this day and age—except at the Republican convention," he quipped. "Not all our meetings were formal, though. There was a good chance to get around and meet other delegates after meetings."

ANY DISPUTES?

There's one question to which you, the textile reader, may have given some thought: Did the meeting break down into a two-sided dispute—the interests of countries producing textiles in great quantities at low cost versus the higher-capital investment, higher-wage group, where textiles are an old-time friend?

Mr. Price pounds an emphatic "no" on that point. "There were no signs of dispute. In fact, results of discussions with the Common Market countries are encouraging. Among these countries, there was a willingness to bend, to give on the question of accepting more imports from new nations."

Price adds: "There was no bilateral bargaining at the meeting. Great Britain and Hong Kong had concluded an agreement before the meeting. And many countries have long-standing agreements in effect—the U. S. and Japan, Canada and Japan, and Great Britain with Hong Kong, India, and Pakistan. The discussions at Geneva all related to long-term, multilateral agreements."

Price further explains: "Within the short-term agreement, any two nations may enter into a bilateral agreement on terms different from those of the Geneva agreement. Also this clause will probably be incorporated into the long-term arrangement. But the U. S. delegation did not discuss any bilateral agreements, and does not now intend to make any agreements other than with the Japanese. That agreement was concluded in September and is due to expire December 31, 1962. The multilateral arrangement should in our case obviate the need for any bilateral agreements."

Mr. Price also believes that discussions covered just about every topic anyone wanted to discuss. "Nothing was left out, as far as I know," Price says. "And the talks at the plenary session were free, open, and frank."

Latest Word On Identifying Today's Fibers

SEVEN TESTS that will help you identify fibers. That's what you'll find in this 13-p. article.

Why is it "must" reading for you? There are at least two reasons:

• Qualitative analysis of textile materials becomes more complex every year. This is a direct result of the variety of man-made fibers on the market and the increasing use of these fibers in blends with each other or with natural fibers.

• The Textile Fiber Products Identification Act, which became law in March 1960, adds new pressure for better methods of fiber identification.

What will you find in the pages ahead?

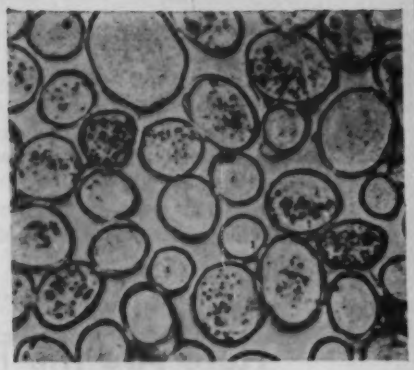
Take just two of the highlights:

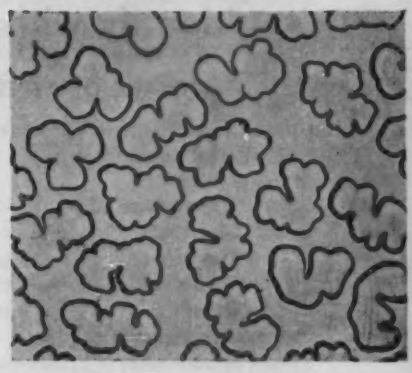
With just nine chemicals you can perform solubility tests that will separate fibers falling into 9 different classifications.

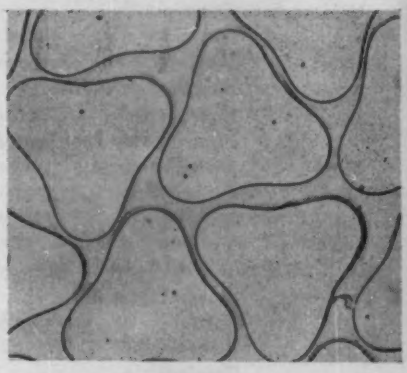
With the table on page 50 and the photomicrographs beginning on page 56, you'll learn what to look for when you examine fibers through a microscope.

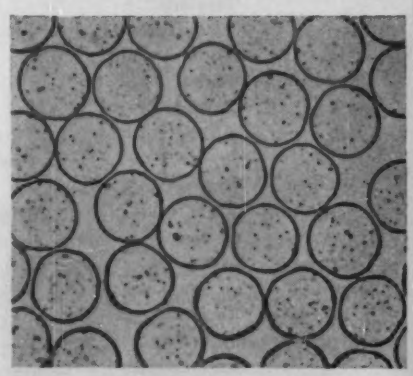
In addition, you'll find new information on five well known tests for fiber identity: heat and flame, stain, specific gravity, melting point, and moisture regain. In fact, these seven basic methods of fiber identification aren't altogether new. But much of the information in the tables and photographs that follow *is* new—or has been updated to meet today's needs for qualitative identification of fibers.

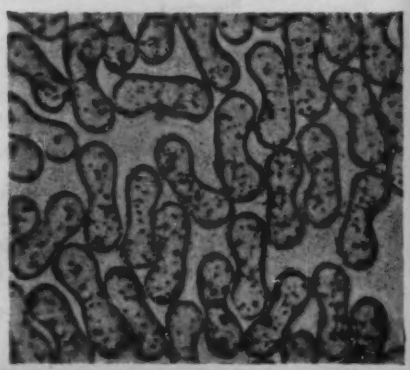
. . . Turn the page











Aware of the need for better fiber-identification methods, the Du Pont Company began a testing program. Aims of the program were twofold: (1) to obtain additional comparative data on the physical and chemical characteristics of fibers, and (2) to set up methods of using these new data, as well as the previously published data, to identify fibers most often used in textile materials.

In this program Du Pont gave special attention to fiber solubility. This was done for two reasons:

1. Definitions assigned by the Federal Trade Commission to the generic names of man-made fibers are based on the chemical structure of these fibers.

2. Chemical agents suitable for qualitative analysis of fiber mixtures are often suited to quantitative analysis as well, but no attempt was made in this program to obtain such methods.

The program covered the generic classes of fibers listed at left.

Here Are the Fibers You Can Identify with 7 Basic Tests

GENERIC	TRADEMARK OR TYPES	TRADEMARK OWNER OR SOURCE
Acetate	'Acele' (secondary acetate)	E. I. du Pont de Nemours & Co.
	'Arnel' (triacetate)	Celanese Fibers Co.
Acrylic	'Acrilan'	Chemstrand Corp.
	'Acrilan' Type 16	Chemstrand Corp.
	'Courtelle'	Courtaulds Ltd.
	'Creslan'	American Cyanamid Co.
	'Dralon'	Farbenfabriken Bayer A. G.
	'Orlon'	E. I. du Pont de Nemours & Co.
	'Orlon Sayelle'[1]	E. I. du Pont de Nemours & Co.
	'Zefran'	Dow Chemical Co.
Modacrylic	'Dynel'	Union Carbide Corp.
	'Verel'	Tennessee Eastman Co.
Nylon	'Antron'[2]	E. I. du Pont de Nemours & Co.
	Nylon 6	Various sources
	Nylon 6–6	Various sources (including du Pont)
	Nylon 6–6 du Pont Type 501	E. I. du Pont de Nemours & Co.
Nytril	'Darvan'	Celanese Fibers Co.
Olefin	Polyethylene	Various sources
	Polypropylene	Various sources
Polyester	'Dacron'	E. I. du Pont de Nemours & Co.
	'Dacron' Type 62	E. I. du Pont de Nemours & Co.
	'Dacron' Type 64	E. I. du Pont de Nemours & Co.
	'Fortrel'	Fiber Industries Inc.
	'Kodel'	Tennessee Eastman Co.
	'Terylene'	Imperial Chemical Industries Ltd.
	'Toray-Tetoron'	Toyo Rayon Co. Ltd.
	'Vycron'	Beaunit Mills Inc.
Rayon	'Corval'	Courtaulds (Alabama) Inc.
	Cuprammonium	Beaunit Mills Inc.
	Fabelta Z-54[3]	Union Des Fabriques Belges De Textiles Artificiels S.A.
	'Fortisan'	Celanese Fibers Co.
	'Topel'	Courtaulds (Alabama) Inc.
	Viscose	Various sources
Saran	Saran	Various sources
Spandex	'Lycra'	E. I. du Pont de Nemours & Co.
	'Vyrene'	United States Rubber Co.
Cotton	Mercerized	United States
	Not mercerized	United States
Flax	Bleached	Ireland
Silk	Boiled-off	Japan
Wool	Cashmere	Iran
	Mohair	United States
	Regular (Merino)	Australia

Single quotes indicate registered trademarks

1. Du Pont's registered trademark for its bicomponent acrylic fiber
2. Du Pont's registered trademark for its trilobal multifilament nylon yarn
3. A similar fiber, known as 'Zantrel,' is produced and marketed in the United States under licenses obtained by Hartford Fibres Company

Note: For identification of some other fibers (that have limited textile use) see text

SELECTING A TEST

When selecting an identification program for a textile sample, you must consider the nature of the sample and the experience and facilities available to the analyst.

Often you have only one class of fiber to identify. Based on your experience with similar materials, you can theorize what fiber is present and then confirm your opinion by a suitable spot test.

On other occasions, when identification is difficult, you may need more complex identification procedures. Here's a procedure used in Du Pont laboratories for difficult identification problems.

- Make a preliminary inspection of the material.
- Make a microscopic examination of a sample taken from the fabric and of fibers from the sample.
- Run solubility tests on the sample, or on fibers from the sample.
- Perform confirmatory tests—stain, specific gravity, melting point, or moisture regain.

In following this procedure you'll find it helpful to have on hand fibers of known identity. Then you can compare the behavior of the known fibers in various tests with that of the unknown fibers that you are identifying.

Take these steps one by one:

By D. J. BRINGARDNER and P. P. PRITULSKY
Textile Fibers Department
E. I. du Pont de Nemours & Co., Inc.

Identification Test 1: HEAT AND FLAME

Test Procedure: Slowly move a specimen of the fiber to be tested toward a small flame and observe the reaction of the fiber to heat. Then push one end of the specimen directly into the flame to determine the burning characteristics of the fiber. After removal from the flame observe the fiber's burning characteristics again and note the burning odor. (Burning odor can be compared with that of known fibers.) Then allow the specimen to cool and check the characteristics of the ash.

You can use groups of fibers, short lengths of yarn, or small pieces of fabric as test specimens, unless the product to be tested contains a combination of yarns or a blend of fibers. In such cases, select individual fibers as test specimens from the textile material with the aid of a magnifying glass.

	Behavior of fibers			
Fibers	**Approaching flame**	**In flame**	**Removed from flame**	**Ash characteristics**
Acetate	Fuses away from flame	Burns with melting	Continues to burn with melting	Leaves brittle, black, irregular-shaped bead
Acrylic	Fuses away from flame	Burns with melting	Continues to burn with melting	Leaves hard, brittle, black, irregular-shaped bead
Modacrylic	Fuses away from flame	Burns very slowly with melting	Self-extinguishing	Leaves hard, black, irregular-shaped bead
Nylon	Fuses and shrinks away from flame	Burns slowly with melting	Usually self-extinguishing	Leaves hard, tough, gray, round bead
Nytril	Fuses away from flame	Burns slowly with melting	Continues to burn with melting	Leaves hard, black, irregular-shaped bead
Olefin	Fuses, shrinks, and curls away from flame	Burns with melting	Continues to burn with melting	Leaves hard, tough, tan, round bead
Polyester	Fuses and shrinks away from flame	Burns slowly with melting	Usually self-extinguishing	Leaves hard, tough, black, round bead
Rayon	Does not fuse or shrink away from flame	Burns without melting	Continues to burn without melting	Does not leave a knob or bead
Saran	Fuses and shrinks away from flame	Burns very slowly with melting	Self-extinguishing	Leaves hard, black, irregular-shaped bead
Spandex	Fuses but does not shrink away from flame	Burns with melting	Continues to burn with melting	Leaves soft, fluffy, black ash
Cotton	Does not fuse or shrink away from flame	Burns without melting	Continues to burn without melting	Does not leave a knob or bead
Flax	Does not fuse or shrink away from flame	Burns without melting	Continues to burn without melting	Does not leave a knob or bead
Silk	Fuses and curls away from flame	Burns slowly with some melting	Burns very slowly; sometimes self-extinguishing	Leaves soft, fluffy, black ash
Wool	Fuses and curls away from flame	Burns slowly with some melting	Burns very slowly; sometimes self-extinguishing	Leaves soft, fluffy, black ash

1. PRELIMINARY LOOK

First you inspect the material carefully to obtain information on its distinctive characteristics. This inspection may indicate:

- Resins or other foreign matter on the material. (Usually you don't remove resins, but if you must, use ASTM Test D 629-59T.)
- Different classes of fibers present in the material.
- Exclusion of certain fibers as components of the material.
- Most appropriate identification tests to use on specimens of the material.

Inspection will also help you select representative samples for subsequent testing. And it may lead to information indicating the presence of specific fibers.

You can often obtain other useful information by using a heat-and-flame test as part of the preliminary inspection. For this test you use a small flame to heat and then ignite the fiber specimen. You'll note the effects of heat, the burning characteristics, and the burning odor of the specimen and use them to determine the subsequent course of your testing.

2. MICROSCOPIC STUDY

Make the first microscopic examination with low magnification—50 to 60X. You can use these results to verify or modify the conclusions you reached in your preliminary inspection.

If more microscopic work is needed, you select groups of fibers from the material and mount and examine them (ASTM Test D 276-60T) at a higher magnification (250 to 500X). Note the longitudinal appearance of individual fibers and compare them with those of known fibers. If a more careful examination is needed, you should determine the cross-sectional appearance. **Longitudinal and cross-sectional photomicrographs for many fibers are shown on pages 56 to 59.**

For natural fibers this microscopic examination should complete the identification. But variations in fiber manufacturing processes may

Identification Test 2: MICROSCOPIC STUDY

Test Procedure: Mount a specimen of the fiber on a slide and examine at 250 to 500X with a microscope. Note and compare the longitudinal as well as the cross-sectional appearance of individual fibers or filaments with those of known fibers. (Longitudinal and cross-sectional photomicrographs of the fibers included in the identification tests are shown at the end of this article.)

Procedures for mounting and examining specimens of fibers are given in the handbook "A. S. T. M. Standards on Textile Materials"

	Fibers	Longitudinal Appearance	Cross-sectional Shape	Group [1]
Acetate	Acele, Amel	Distinct lengthwise striations. No cross-markings.	Irregular shape with crenulated or serrated outline	I
Acrylic	Acrilan regular, Acrilan Type-16, Courtelle, Creslan, Zefran	Rod-like with smooth surface and profile	Round or nearly round (Includes bean shape)	II
	Dralon, Orlon	Broad and often indistinct lengthwise striation. No cross markings	Dog-bone	III
	Orlon Sayelle	Lengthwise striations. No cross-markings	Irregular mushroom or acorn	IV
Modacrylic	Dynel	Lengthwise striations. No cross-markings	Irregular worm-like or ribbon-like	V
	Verel	Broad and often indistinct lengthwise striation. No cross-markings	Dog-bone	III
Nylon	Nylon 6, nylon 6–6	Rod-like with smooth surface and profile	Round or nearly round	II
	Certain types of nylon 6–6 (including Antron and Du Pont Type 501)	Broad and sometimes indistinct lengthwise striations. No cross-markings.	Trilobal	VI
Nytril	Darvan	Distinct lengthwise striations. No cross-markings.	Irregular shape with crenulated or serrated outline	I
Olefin	Polyethylene, polypropylene	Rod-like with smooth surface and profile	Round or nearly round	II
Polyester	Dacron, Dacron Type 64, Fortrel, Kodel, Terylene, Toray-Tetoron, and Vycron	Rod-like with smooth surface and profile	Round or nearly round	II
	Dacron Type 62	Broad and sometimes indistinct lengthwise striations.	Trilobal	VI
Rayon	Corval, Fortisan, Topel, viscose	Distinct lengthwise striations. No cross-markings.	Irregular shape with crenulated or serrated outline.	
	Cuprammonium, Fabelta Z-54	Rod-like with smooth surface and profile	Round or nearly round	II
Saran	Saran	Rod-like with smooth surface and profile	Round or nearly round	II
Spandex	Lycra	Broad and often indistinct lengthwise striation. No cross-markings	Dog-bone	III
	Vyrene	Dark. Very large size. No cross-markings.	Irregular shape. Very large filaments	VII
Cotton	Mercerized and not mercerized	Ribbon-like with convolutions that sometimes change direction. No significant lengthwise striations.	Tubular shape with tubes usually collapsed and irregular in size	VIII
Flax	Bleached	Bamboo-like with pronounced cross-marking nodes and fissures. No significant lengthwise striations	Tubular shape with tubes often collapsed and very irregular in size as well as shape.	IX
Silk	Boiled-off	Smooth surface and profile, but may contain nodes. No lengthwise striations	Mostly triangular with point of triangle usually rounded off. Irregular in size and shape.	X
Wool	Cashmere, mohair, and regular (Merino)	Rough surface with cross-markings caused by surface scales.	Round or nearly round	XI

[1] Here are the fibers that could be present in each group:

Group I	Acetate, nytril, rayon	Group IV	Acrylic	Group VIII	Cotton
Group II	Acrylic, nylon, olefin, polyester, rayon, saran	Group V	Modacrylic	Group IX	Flax
		Group VI	Nylon, polyester	Group X	Silk
Group III	Acrylic, modacrylic, spandex	Group VII	Spandex	Group XI	Wool

You can use solubility as one method of distinguishing the fibers within a group containing more than one fiber:

Group I Acetate fibers are soluble in glacial acetic acid at 100 F., but nytril and rayon fibers are not soluble.
Rayon fibers are soluble in concentrated (37 to 38%) hydrochloric acid at 75 F., but nytril fibers are not soluble.

Group II Nylon fibers are soluble in 20% hydrochloric acid (density = 1.096) at 75 F., but acrylic, olefin, polyester, rayon and saran fibers are not soluble.
Rayon fibers are soluble in concentrated (37 to 38%) hydrochloric acid at 75 F., but acrylic, olefin, polyester, and saran fibers are not soluble.
Saran fibers are soluble in dioxane-1, 4 at 200 F., but acrylic, olefin, and polyester fibers are not soluble.
Olefin fibers are soluble in boiling meta-xylene, but acrylic and polyester fibers are not.
Acrylic fibers are soluble in boiling 70% ammonium thiocyanate, but polyester fibers are not soluble.

Group III Acrylic fibers are soluble in boiling 70% ammonium thiocyanate, but modacrylic and spandex fibers are not soluble.
Modacrylic fibers are soluble in butyrolactone at 75 F., but spandex fibers are not soluble.

Group VI Nylon fibers are soluble in 20% hydrochloric acid (density = 1.096) at 75 F., but polyester fibers are not soluble.

Identification Test 3A: SOLUBILITY

Test Procedure: Place a specimen first in one and then another of the liquids using the numerical sequence shown below. (The liquid-to-specimen weight ratio should be at least 100 to 1.) In each liquid, stir the specimen periodically for 5 minutes, and carefully note the effect of the liquid on the specimen. You may need special illumination to observe the results of the test.

You can use small clumps of fibers, short lengths of yarn, or small pieces of fabric as test specimens. But, if there is any doubt about the results, test individual fibers. Carefully select such fibers from the textile material to assure that specimens of each fiber present are tested. You can facilitate the selection of the individual fibers by using a magnifying glass or microscope.

S = Fiber soluble or disintegrated P = Fiber partly soluble or partly disintegrated I = Fiber insoluble

Caution: These are hazardous liquids and should be handled with care. Use exhaust hoods, gloves, aprons, and goggles for fiber solubility work.

Chemical agent	Concentration (1) (% by weight)	Density (at 75 F.)	Temperature (F.)	Acetate	Nylon	Silk & Wool	Olefin & Saran	Acrylic	Modacrylic & Nytril	Spandex	Cotton, Flax, & Rayon	Polyester
1. Acetic Acid, glacial			75	S(3)	I	I	I	I	I	I	I	I
2. Hydrochloric Acid	20	1.096	75	I	S	I	I	I	I	I	I	I
3. Sodium Hypochlorite Solution (pH 11)	(5% Avail. Chlorine)		75	I	I	S(4)	I	I	I	I	I	I
4. Xylene, (meta-)			282(2)	I	I	I	S(5)	I	I	I	I	I
5. Ammonium Thiocyanate	70		266(2)	I	I	I	I	S	I	I	I	I
6. Butyrolactone			75	S	I	I	I	I	S(6)	I	I	I
7. Dimethyl Formamide			200	S	I	I	I & S	S	S	S	I	I
8. Sulfuric Acid	75	1.665	75	S	S	S & I	I	S & I	I	P	S(7)	I
9. Cresol, (meta-)			200	S	S	I	I	I	P	P	I	S

1. If not otherwise specified, the concentration in testing was approximately 100%. Where lower levels are specified, water was used as the diluent.
2. At the boil.
3. Vigorous agitation may be required to dissolve triacetate fibers in the specified time. A more rapid dissolution can be accomplished at 100 F.
4. Silk and wool fibers can be separated by dissolving the silk in concentrated (37 to 38%) hydrochloric acid at 75 F. Wool fibers are not soluble.
5. Olefin and saran fibers can be separated by dissolving the saran in dioxane-1, 4 at 200 F. Olefin fibers are not soluble.
6. Modacrylic and nytril fibers can be separated by dissolving the nytril in 60% nitric acid (density = 1.362) at 75 F. Modacrylic fibers are not soluble.
7. Rayon fibers can be separated from cotton and flax fibers by dissolving the rayon in concentrated (37 to 38%) hydrochloric acid at 75 F. Cotton and flax fibers are not soluble. Cotton and flax can be distinguished by their longitudinal appearance when observed with a microscope.

FIBER IDENTIFICATION . . . *Begins on page 47*

have radically changed the appearance of man-made fibers. Therefore the suitability of microscopic examination for positive identification of man-made fibers is quite limited unless you're familiar with all the variations. But even though you don't know all these variations, the microscope is still a useful tool in preliminary inspection and in selection of fibers for subsequent testing.

3. SOLUBILITY TEST

After the microscopic examination you divide fibers into groups for identification by solubility.

At this stage of the procedure you may know the identity of one or more fibers in the material. You can verify this identity by determining whether the fiber specimen (or material) will dissolve or disintegrate in selected liquids. You'll find above a list of liquids that will dissolve or disintegrate each class of fibers. The complete table of solubility, from which these liquids were selected, is on page 52. You should use the data in both of these tables only for fiber identification tests because their suitability for quantitative analysis has not been determined in every instance.

But if you don't know the composition of the material, you should take specimens from a representative sample of the material and immerse them in the liquids prescribed, using the numerical sequence shown in the table. The concentration and temperature of the liquid should be as specified. When you use small clumps of fibers or single fibers in the solubility test, select them carefully to insure that each of the different classes of fibers in the textile material is tested in every liquid. Good illumination is a "must" for observing the effect of the liquids on single fibers. The liquids must be used in the numerical sequence specified if you expect to remove each class of fibers systematically. The order of removal of the fiber classes by the series of liquids is also shown in the table. If you know that certain fibers are not in the textile material, you may omit the solvents for these fibers from the tests.

The solubility tests provide a positive means of identifying the man-made fibers by generic class. You can also use them to confirm the microscopic identification of natural fibers.

Also you can often use solubility tests to distinguish between different fibers within the same generic class. For example, with selected solvents from the general table of solubility (page 52) you can separate acetate from triacetate, Dynel from Verel, and nylon 6 from nylon 6-6.

4. STAIN TEST

Textile mills often use this test to identify fibers or to confirm identifications made by other methods. Various dye manufacturers make stains for this purpose. The tests are usually applicable only to white and light-colored fibers or to dyed fibers that can be stripped to a light shade. The stain manufacturer provides instructions on staining procedures as well as cards showing typical colors after staining of the principal fibers. Most of these stain tests are simple to perform.

. . . *Turn the page*

Identification Test 3B: SOLUBILITY

Test Procedure: Place a specimen in the appropriate liquid and stir it periodically for 5 minutes. (The liquid-to-specimen weight ratio should be at least 100 to 1.) Note the effect of the liquid on each specimen. You may need special illumination to observe results.

You can use small clumps of fibers, short lengths of yarn, or small pieces of fabric as test specimens. But, if there is any doubt about the results, you should test individual fibers. Select such fibers from the textile material to be sure you test specimens of each fiber present. A magnifying glass or microscope will help you select the individual fibers.

S = Fiber soluble or completely disintegrated P = Fiber partly soluble or partly disintegrated I = Fiber insoluble

Caution: These are hazardous liquids and should be handled with care. Use chemical laboratory exhaust hoods, gloves, aprons, and goggles.

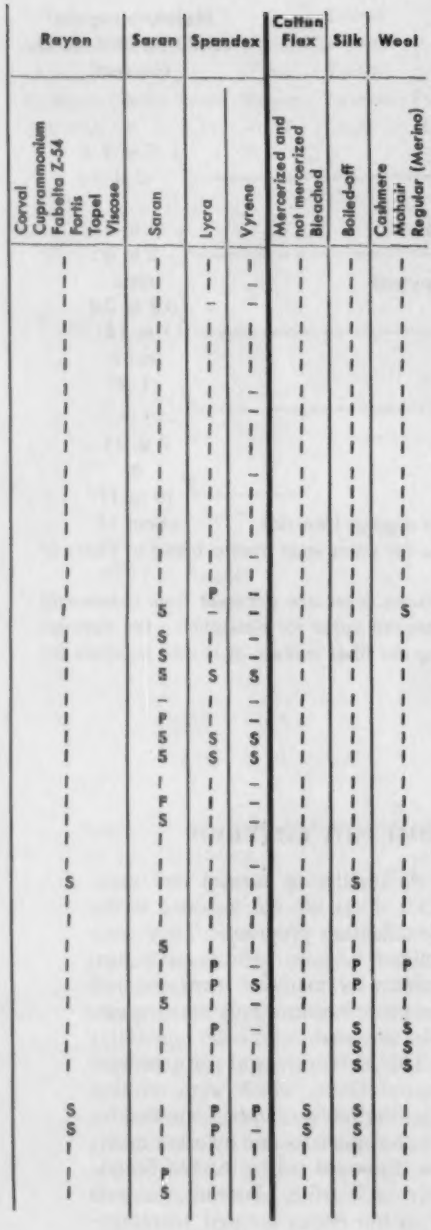
Chemical agent	Concentration(1) (% by weight)	Density (at 75 F.)	Temperature (F.)	Acetate		Acrylic			Modacrylic		Nylon		Nytril	Olefin		Polyester			
				Secondary (Acele)	Triacetate (Arnel)	Acrilan regular Acrilan Type 16 Courtelle Dralon Orlon Orlon Sayelle Zefran	Creslan	Dynel	Verel	Nylon 6	Antron Nylon 6-6 and Dupont Type 501	Darvan	Polyethylene	Polypropylene	Dacron Dacron Type 62 Dacron Type 64 Fortrel Terylene Toray-Tetoron	Kodel	Vycron
Acetic Acid, glacial			75	S	S	I	I	I	I	I	I	I	I	I	I	I	I	I
Acetic Acid, glacial			200	S	S	I	I	I	I	S	P	I	I	I	I	I	I	I
Acetic Acid, glacial			244(2)	S	S	I	I	I	I	S	S	I	I	I	I	I	–	–
Acetone			75	S	P	I	I	P	I	I	I	I	I	I	I	I	I	I
Acetone			133(2)	S	S	I	I	S	S	I	I	P	I	I	I	I	I	I
Acetone	65		75	S	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Acetonitrile			75	S	I	I	I	I	S	I	I	I	I	I	I	I	I	I
Acetonitrile			180(2)	S	–	I	I	S	S	I	I	S	–	–	I	I	I	I
Ammonium Thiocyanate	70		200	I	I	S(3)	S	I	I	I	I	I	I	I	I	I	I	I
Ammonium Thiocyanate	70		266(2)	I	I	S	S	I	I	I	I	I	I	I	I	I	I	I
Benzyl alcohol			200	S	I	I	I	I	I	I	I	I	–	–	I	I	I	I
Butyrolactone			75	S	S	I	I	S	S	I	I	S	I	I	I	I	I	I
Butyrolactone			200	S	S	S	S	S	S	I	I	S	I	I	I	I	I	I
Carbon tetrachloride			170(2)	I	I	I	I	I	I	I	I	I	S	P	I	I	I	I
Chloroform			75	I	S	I	I	I	I	I	I	I	I	I	I	I	I	I
Cresol (meta-)			75	S	S	I	I	I	I	S	S	I	I	I	I	I	I	I
Cresol (meta-)			200	S	S	I	I	P	I	S	S	P	I	I	S	S	S	S
Cresol (meta-)			396(2)	S	S	I	I	P	S	S	S	S	–	–	S	S	S	S
Cyclohexanone			75	I	I	I	I	P	I	I	I	I	I	I	I	I	I	I
Cyclohexanone			200	S	S	I	I	S	S	I	I	S	I	–	I	I	I	I
Cyclohexanone			313(2)	S	S	I	I	S	S	I	I	S	S	S	P	–	S	S
Dimethyl acetamide			75	S	S	I(4)	P	S	S	I	I	S	–	–	I	I	I	I
Dimethyl formamide			75	S	S	P(3)	S	S	S	I	I	S	I	I	I	I	I	I
Dimethyl formamide			200	S	S	S	S	S	S	I	I	S	I	I	I	I	I	I
Dimethyl formamide			307(2)	S	S	S	S	S	S	–	I	S	–	–	S	I	S	S
Dimethyl sulfoxide			75	S	S	P	S	S	S	I	I	S	I	–	I	I	I	I
Dioxane-1, 4			75	S	S	I	I	I	I	I	I	I	I	I	I	I	I	I
Dioxane-1, 4			200	S	S	I	I	P	P	I	I	I	I	I	I	I	I	I
Ethylene carbonate			200	S	I	S	S	S	P	I	I	S	–	–	I	I	I	I
Formic acid	85		75	S	S	I	I	I	I	S	S	I	I	I	I	I	I	I
Hydrochloric acid	37 to 38		75	S	P	I	I	I	I	S	S	I	I	I	I	I	I	I
Hydrochloric acid	20.	1.096	75	I	I	I	I	I	I	S	S	I	I	I	I	I	I	I
Hydrochloric acid	15.5	1.073	75	I	I	I	I	I	I	S	I	I	I	I	I	I	I	I
Monochlorobenzene			269(2)	P	I	I	I	P	I	I	I	I	S	S	I	I	I	P
Nitric acid	70	1.407	75	S	S	S	S	I	–	S	S	S	I	I	I	I	I	I
Nitric acid	60	1.362	75	S	P	S	S	I	I	S	S	S	I	I	I	I	I	I
Pyridine			200	S	S	I	I	S	S	–	–	I	–	–	I	I	I	I
Sodium hydroxide	40		At Boil	P	P	I	I	I	I	I	I	–	I	I	S	P	S	S
Sodium hydroxide	5		At Boil	P	P	I	I	I	I	I	I	I	I	I	I	I	I	I
Sodium hypochlorite solution (pH 11)	(3.6 or 5.0% available chlorine)		75	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Sulfuric acid	75	1.665	75	S	S	–	S	I	I	S	S	I	I	I	I	I	I	I
Sulfuric acid	69	1.595	75	S	S	I	I	I	I	S	S	I	I	I	I	I	I	I
Sulfuric acid	40	1.300	75	I	I	I	I	I	I	S	S	I	I	I	I	I	I	I
Xylene (meta-)			200	I	I	I	I	I	I	I	I	I	P	P	I	I	I	I
Xylene (meta-)			282(2)	I	I	I	I	I	I	I	I	I	S	S	I	I	I	I

Note: Use these data only for fiber identification. Their suitability for quantitative analysis was not determined in every case.

1. If not otherwise specified, the concentration was approximately 100%. Where lower levels of concentration are specified, water was used as the diluent.
2. At the boil.
3. Zefran insoluble.
4. Courtelle and Dralon partly soluble.

Basically the fiber or fabric sample is wet-out, stained in the solution, rinsed, and dried.

Sometimes it's hard to distinguish one fiber from another because the fibers are intimately blended or because they are stained to about the same color. In such cases, you may find it helpful to examine the stained material under a microscope. Also you can subject known fibers, in the same physical form as the test specimens, to the same stain test for color comparisons. It's also helpful to use several different identification stains to determine which one is the most suitable for the particular problem. You can also use them in cross-checking your fiber identification program.



5. MELTING-POINT TEST

You can also use this test to distinguish among many of the fibers or to confirm an identification made by other methods. The melting point of various fibers is listed below, along with an outline of the procedure used to determine the value shown. You should use this exact procedure in the test, because other procedures and test equipment may give different values for the melting point of the same fiber.

As you'll note in the table the melting-point test can also be used to differentiate among certain fibers in the same generic class. For example, nylon 6 and 6-6 have a different melting point (213 C. and

Identification Test 5: MELTING POINT

Test Procedure: Place a single filament or single fiber between 19-millimeter micro-cover glasses; on a calibrated Fisher-Johns melting point apparatus (Fisher Scientific Co.). Observe the specimen with a magnifying glass while raising the fiber temperature. (The temperature may be raised as quickly as possible to about 15 C. below the anticipated melting point. Thereafter, the rate of temperature rise should be limited to 3 or 4 C. per minute.) The melting point is that temperature at which flow of the fiber is first observed when a slight downward pressure is exerted on the upper cover glass.

Fibers		Melting point (C.)	(F.)
Acetate	Secondary (Acele)	260	500
	Triacetate (Arnel)	288	550
Acrylic	All (including Orlon and Orlon Sayelle)	Indeterminate	
Modacrylic	Dynel	188[1]	371[1]
	Verel	210[1]	410[1]
Nylon	Nylon 6	213	415
	Nylon 6-6 (including Antron)	250	482
Nytril	Darvan	218[1]	424[1]
Olefin	Polyethylene	135	275
	Polypropylene	170	338
Polyester	Dacron, Fortrel, Terylene, Toray-Tetoron	250	482
	Kodel	282	540
	Vycron	232	450
Rayon	All	Indeterminate	
Saran	All	168	335
Spandex	Lycra, Vyrene	230[1]	446[1]
Cotton	All (including mercerized and not mercerized)	Indeterminate	
Flax	Bleached	Indeterminate	
Silk	Boiled-off	Indeterminate	
Wool	Cashmere, mohair, regular (Merino)	Indeterminate	

[1] Approximate value. Fiber softens at a somewhat lower temperature, and reproducible melting point values are difficult to obtain.

. . . *Begins on page 47*

250 C. respectively). Also in the polyester group you can distinguish Dacron, Fortrel, Terylene, and Toray-Tetoron from either Kodel or Vycron by their melting points.

6. MOISTURE-REGAIN TEST

This test is sometimes useful in confirming the composition of a textile material containing only one fiber, or of a textile material containing two or more fibers if the fibers can be easily separated from the material and from each other. In this test, you dry and weigh a specimen of the fiber to be identified, then condition it in air at 70 F., 65% r.h. You determine the moisture regain from the increase in weight of the fiber specimen during conditioning. The moisture regain of various fibers at the specified conditions is shown in the table on this page together with an outline of the test procedure.

7. SPECIFIC-GRAVITY TEST

This test gives you another method of differentiating among fibers or confirming your identifications. In this test you place a specimen of the unknown fiber in a liquid of known specific gravity and observe it to determine whether it sinks or floats.

The chart on the facing page gives you the specific gravity of various fibers and outlines a procedure for making the test.

OTHER TESTS

Several other tests are useful to confirm your identification of fibers. Take them one by one:

Refractive index—The refractive indices of most of the fibers in the program are listed (facing page) with the test procedure used to determine refractive index.

Infrared spectrum—With an infrared spectrophotometer you scan the spectrum of a solvent-cast film, a melt-pressed film, or a potassium bromide (KBr) disk made from a specimen of the fiber. You can also use these spectra to distinguish among fibers within a generic class. (ASTM is considering the addition of an appendix dealing with infrared spectra of man-made fibers to their standard Test D 276-60T.)

Heat discoloration—You determine the degree of discoloration of a fiber specimen after exposure for a specified length of time in air at 350 F. Then you compare the discoloration of the unknown fiber with that of known fibers.

Mechanical properties—You can sometimes use mechanical properties (such as breaking tenacity and breaking elongation) for identification purposes because these properties vary with different classes of fibers.

Spandex fibers' high breaking elongation (over 500%) and their essentially complete recovery from very high elongation are particularly suitable for distinguishing them from the other fibers in the identification program.

Identification Test 6: MOISTURE REGAIN

Test Procedure: Place a carefully selected specimen of the fiber in an uncovered tared, weighing can and dry in an oven at 220 F. for two hours. Then place a tared cover on the can and remove it from the oven. Allow the can to cool in a desiccator and then weigh it to determine the dry net weight of the specimen. Condition the dried specimen in the uncovered can at 70 F., 65% r. h. for 24 hours. Then recover and reweigh to determine the conditioned net weight of the specimen. You calculate the moisture regain of the fiber from the following formula:

$$\text{Moisture regain (percent)} = \frac{\text{Net weight of conditioned specimen} - \text{Net weight of dried specimen}}{\text{Net weight of dried specimen}} \times 100$$

Fibers		Moisture regain[1] At 70 F., 65% R. H. (percent)
Acetate	Secondary (Acele)	6
	Triacetate (Arnel)	4
Acrylic	All	1.5 to 2.5
Modacrylic	Dynel	0.4
	Verel	. . .
Nylon	Nylon 6 and nylon 6-6	4 to 5
Nytril	Darvan	2 to 3
Olefin	Polyethylene, polypropylene	none
Polyester	All	0.2 to 0.8
Rayon	All	11 to 14
Saran	All	none
Spandex	Lycra	1.3
	Vyrene	. . .
Cotton	All	7 to 11
Flax	Bleached	8
Silk	Boiled-off	10 to 11
Wool	Cashmere, mohair, and regular (Merino)	about 15

Note: In general, this test is not suitable for yarns spun from a blend of fibers or for fabrics made from such yarns.

1. These are actual regains and in many cases are different from commercial regains. Commercial regain is the accepted value for determining the commercial weight of fibers and for calculating the fiber content of textile products for labeling.

SOME NOT COVERED

A number of natural and man-made fibers are not included in the identification program. They were omitted because identification procedures for many of them are well known or because only small quantities are used.

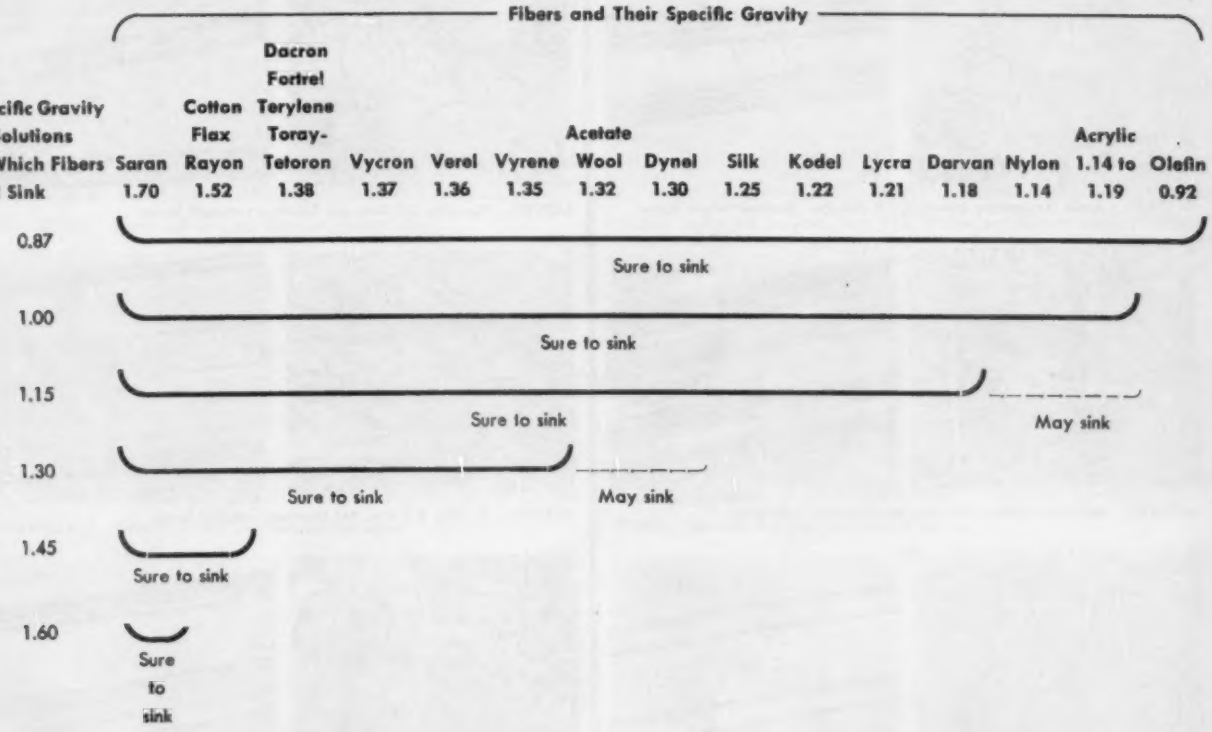
The cellulose and protein-base natural fibers, which were omitted from the tables, can be identified by microscopic tests and by other methods discussed in the ASTM Standards on Textile Materials, as well as in the books entitled Identification of Textile Materials (Textile Institute, Manchester, England) and Identification of Textile Fibres, by Bruno Luniak (Pitman Publishing Corp., New York City).

Teflon fiber and glass fibers can

Identification Test 7. SPECIFIC GRAVITY

Test Procedure: Place a single-filament or single-fiber specimen in a series of specially prepared liquids of known specific gravity. If the specific gravity of the fiber is greater than that of the liquid, the specimen will sink to the bottom of the liquid. Conversely, if the specific gravity of the fiber is lower, the specimen will float. (The surface of the fiber must be free of air bubbles since they can affect the results of the test.)

You prepare a suitable series of liquids for this test by mixing, in various proportions, carbon tetrachloride (specific gravity of 1.60 at room temperature) with xylene (specific gravity of 0.87 at room temperature). Before using any of the liquids for fiber identification, check the specific gravity of each liquid with calibrated hydrometer.



be distinguished from all other fibers by the following:

1. High specific gravity—Teflon = 2.3, glass = 2.6.

2. High resistance to chemical degradation—Neither is dissolved by the chemicals listed in the general solubility table. You can distinguish Teflon and glass from each other by dissolving the glass in hydrofluoric acid.

3. High resistance to heat degradation—Neither of these fibers is appreciably degraded by exposure for one hour to air at 550 F.

RELATED LITERATURE: A comprehensive list of literature on the general subject of fiber identification is presented on page 162 and is also included in Du Pont Technical Infomation Bulletin X-156 entitled Identification of Fibers in Textile Materials.

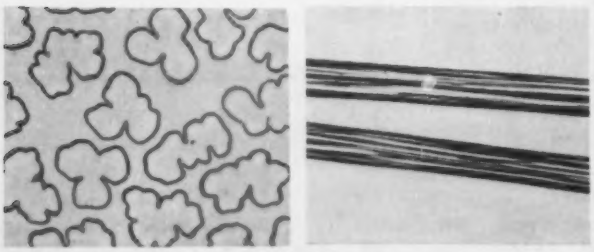
REFRACTIVE INDEX TEST

Test Procedure: Immerse a single filament for single fiber in a suitable liquid and illuminate by polarized light vibrating parallel or perpendicular to the axis of the fiber. Then examine the single filament or single fiber with the microscope and use the Becke Line method to determine the refractive index.

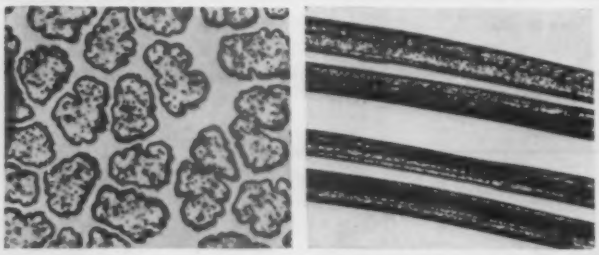
Fibers	Refractive index: Light vibrating parallel to fiber axis $N_{\parallel}$	Refractive index: Light vibrating perpendicular to fiber axis $N_{\perp}$	Birefringence ($N_{\parallel}$ minus $N_{\perp}$) ΔN
Acetate	1.47 to 1.48	1.47 to 1.48	less than 0.01
Acrylic	1.50 to 1.53	1.50 to 1.53	little or none
Modacrylic	about 1.54	about 1.53	less than 0.01
Nylon	1.57 to 1.59	1.51 to 1.53	0.06
Nytril	about 1.48	about 1.48	little or none
Olefin	about 1.56	about 1.51	0.05
Polyester (except Kodel)	1.71 to 1.73	1.53 to 1.54	0.18
Kodel	.....	.....	....
Rayon	1.54 to 1.56	1.51 to 1.53	0.03
Saran	1.61	1.61	little or none
Spandex	.....	.....	....
Cotton	1.56 to 1.59	1.52 to 1.54	0.05
Flax	1.58 to 1.60	1.52 to 1.53	0.06
Silk	1.59	1.54	0.05
Wool	1.56	1.55	0.01

Photomicrographs Show Cross Section and

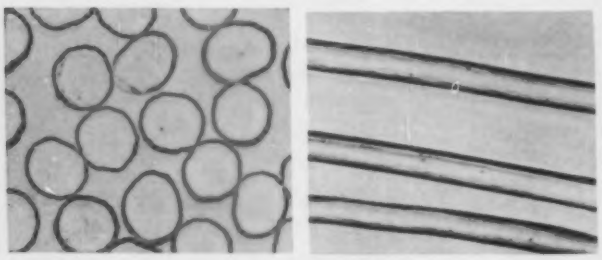
Cross-Sectional View at 500X | Longitudinal View at 250X



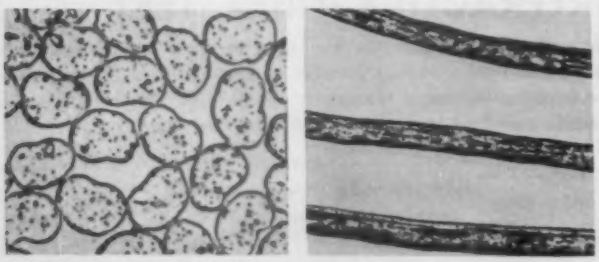
ACETATE: Acele (Secondary acetate), 3.8 den. per filament bright luster



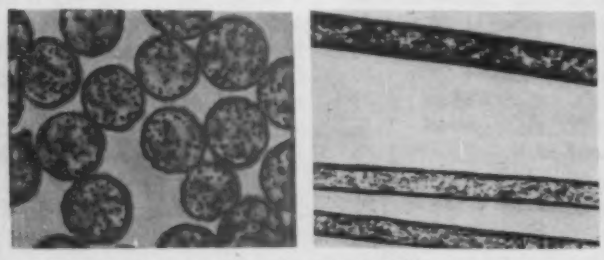
ACETATE: Arnel (triacetate), 2.5 den. per filament dull luster



ACRYLIC: Acrilan, 3.0 den. per filament bright luster

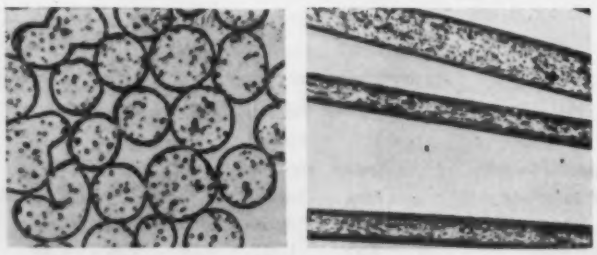


ACRYLIC: Acrilan Type-16, 3.0 den. per filament semidull luster

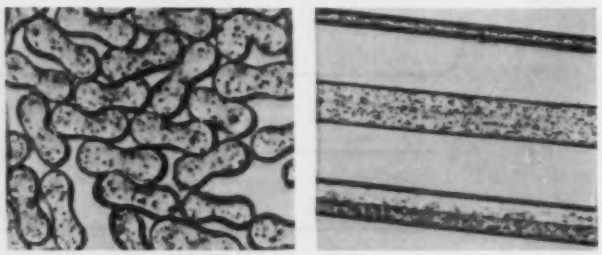


ACRYLIC: Courtelle, 3.0 den. per filament semidull luster

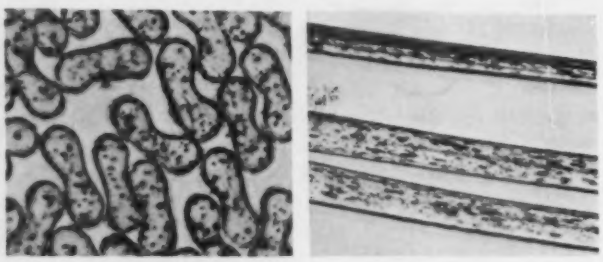
Cross-Sectional View at 500X | Longitudinal View at 250X



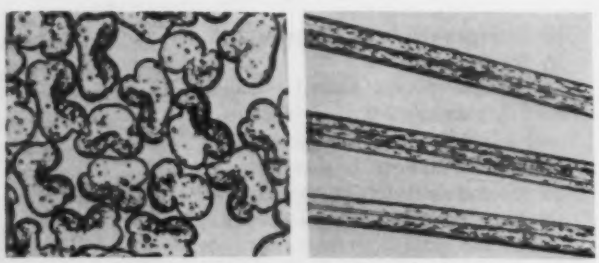
ACRYLIC: Creslan, 3.0 den. per filament semidull luster



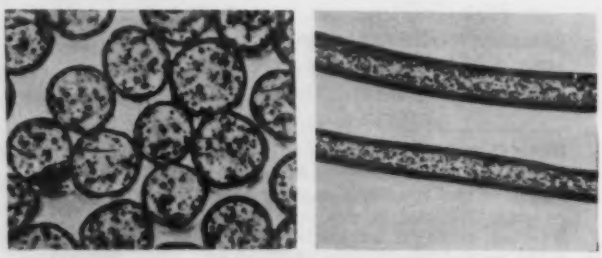
ACRYLIC: Dralon, 2.3 den. per filament semidull luster



ACRYLIC: Orlon Sayelle, 3.0 den. per filament semidull luster



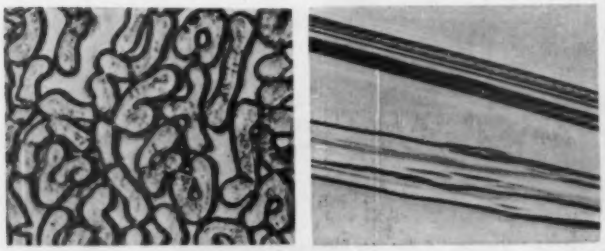
ACRYLIC: Orlon, 3.0 den. per filament semidull luster



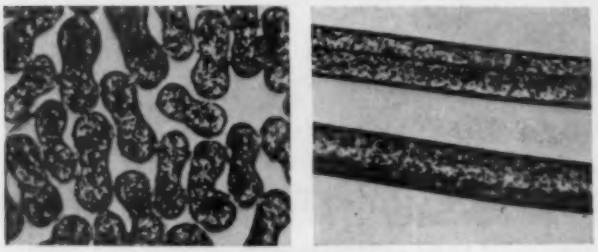
ACRYLIC: Zefran, 3.0 den. per filament semidull luster

Longitudinal Views of Fibers Identified . . . *Begins on page 47*

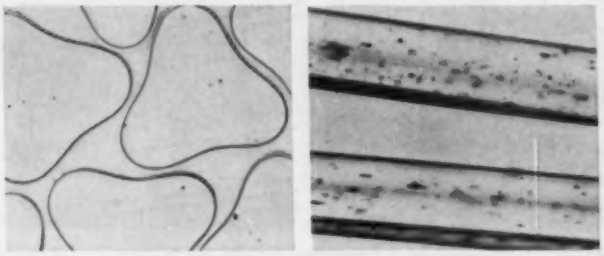
Cross-Sectional View at 500X | Longitudinal View at 250X



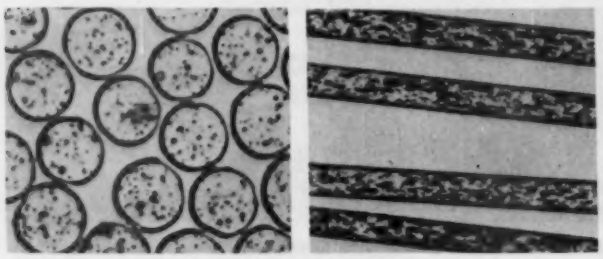
MODACRYLIC: Dynel, 3.0 den. per filament natural luster



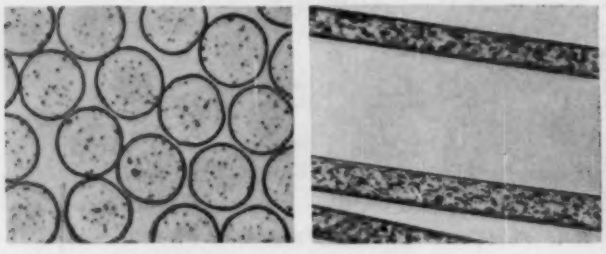
MODACRYLIC: Verel, 3.0 den. per filament dull luster



NYLON: Antron, 15 den. per filament bright luster

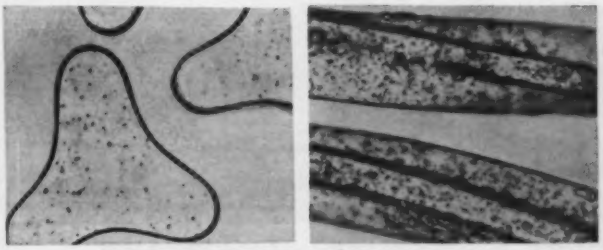


NYLON: nylon 6, 3.1 den. per filament semidull luster

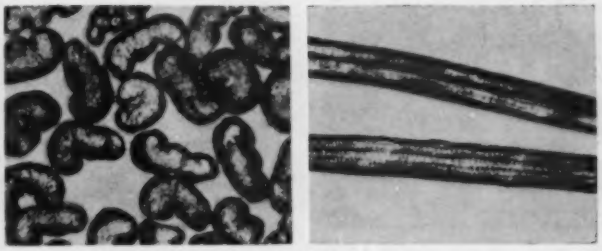


NYLON: nylon 6-6, 3.1 den. per filament semidull luster

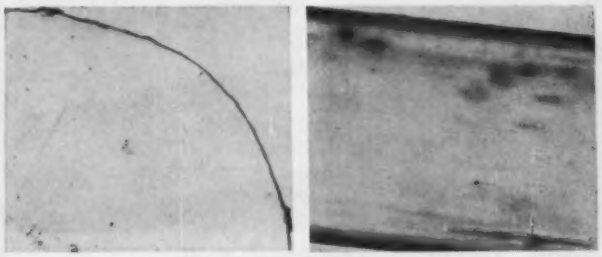
Cross-Sectional View at 500X | Longitudinal View at 250X



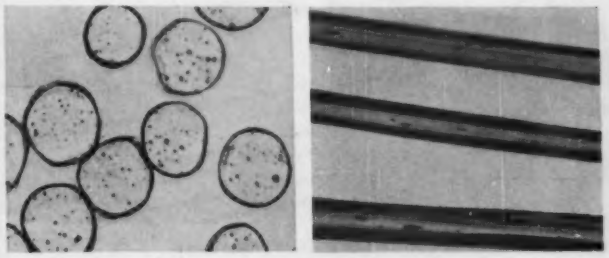
NYLON: nylon 6-6 Du Pont, Type 501, 18 den. per filament semidull luster



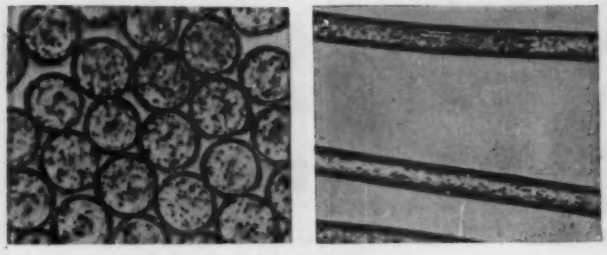
NYTRIL: Darvan, 2.0 den. per filament dull luster



OLEFIN: polyethylene, 90 den. per filament natural luster



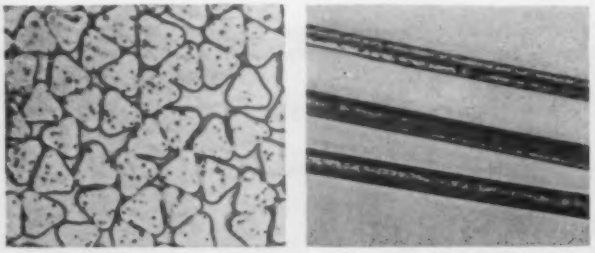
OLEFIN: polypropylene, 3.0 den. per filament natural luster



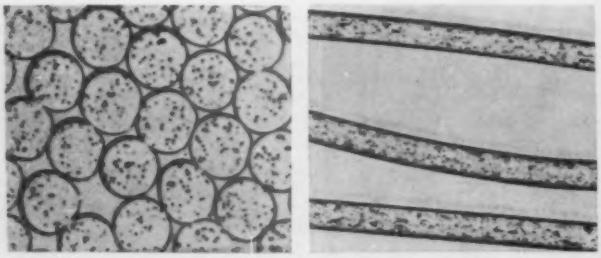
POLYESTER: Dacron, 3.0 den. per filament semidull luster

Photomicrographs Show Cross Section and

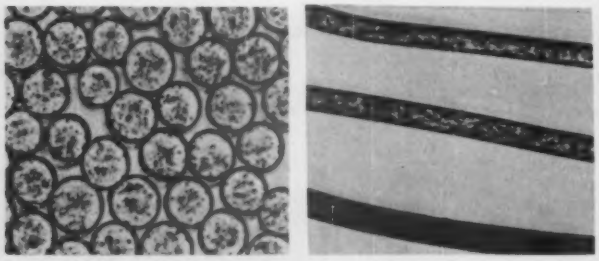
Cross-Sectional View at 500X | Longitudinal View at 250X



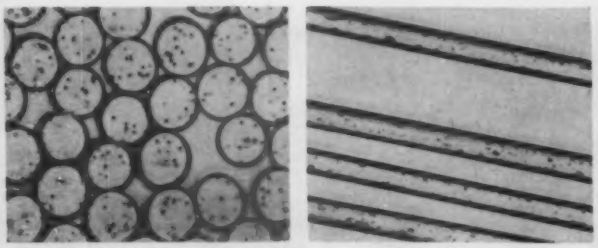
POLYESTER: Dacron, Type 62, 1.4 den. per filament semidull luster



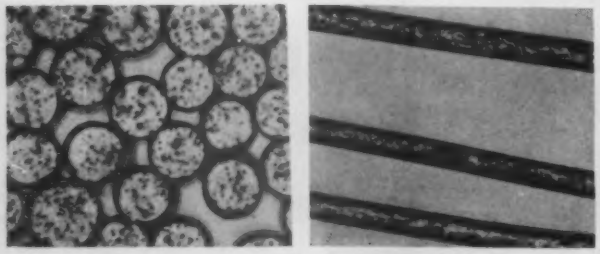
POLYESTER: Dacron, Type 64, 3.0 den. per filament semidull luster



POLYESTER: Kodel, 2.3 den. per filament semidull luster

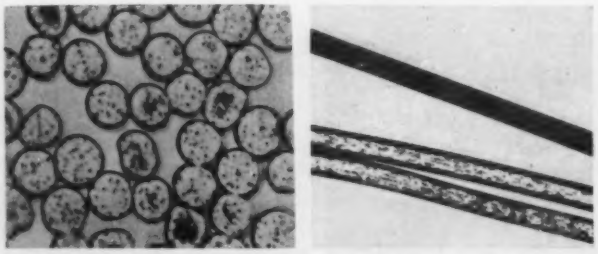


POLYESTER: Terylene, 2.3 den. per filament bright luster

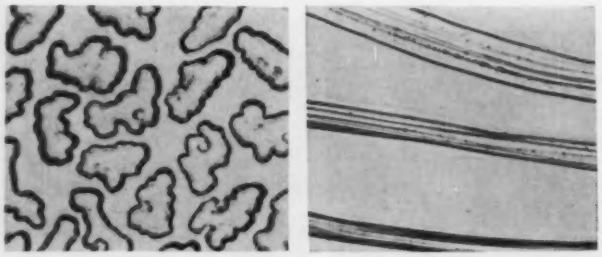


POLYESTER: Toray-Tetoron, 3.0 den. per filament semidull luster

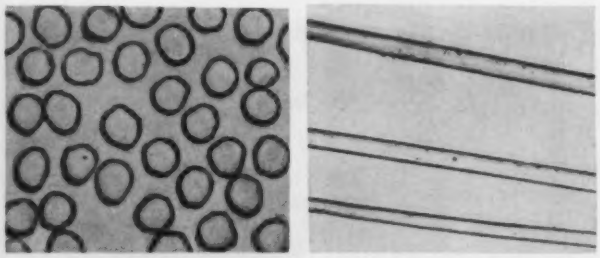
Cross-Sectional View at 500X | Longitudinal View at 250X



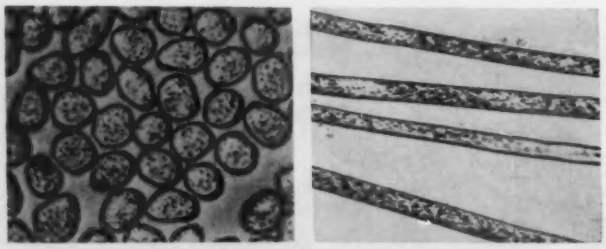
POLYESTER: Vycron, 1.5 den. per filament semidull luster



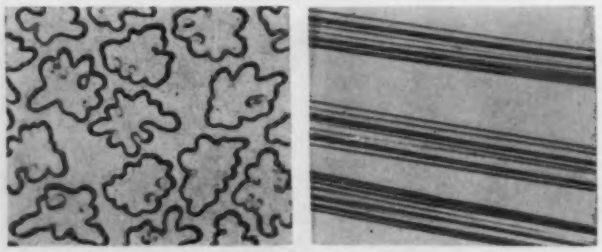
RAYON: Corval, 3.0 den. per filament bright luster



RAYON: Cuprammonium, 1.3 den. per filament bright luster



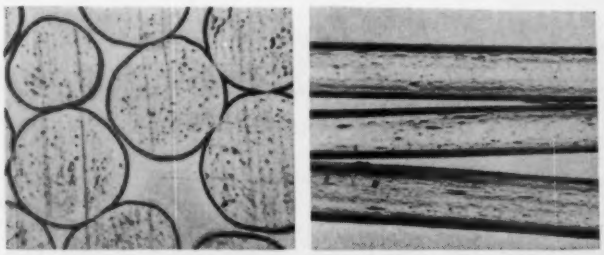
RAYON: Fabelta Z-54, 1.5 den. per filament semidull luster



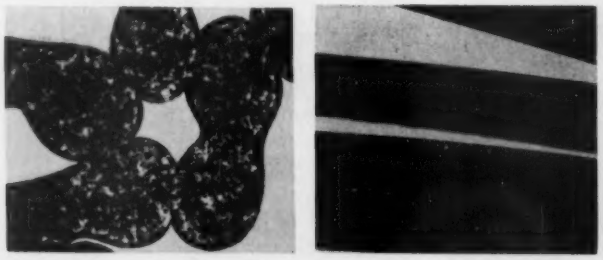
RAYON: viscose, 3.8 den. per filament bright luster

Longitudinal Views of Fibers Identified . . . *Begins on page 47*

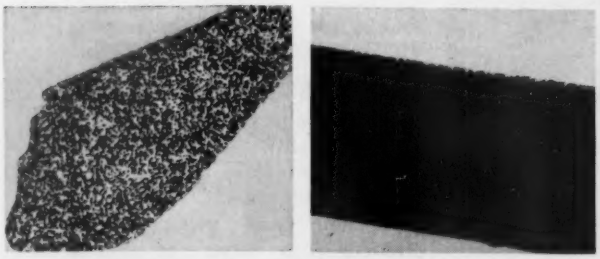
Cross-Sectional View at 500X | Longitudinal View at 250X



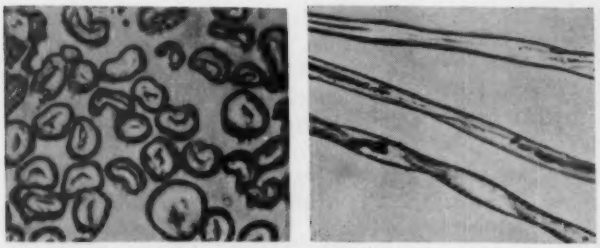
SARAN: 16 den. per filament natural luster



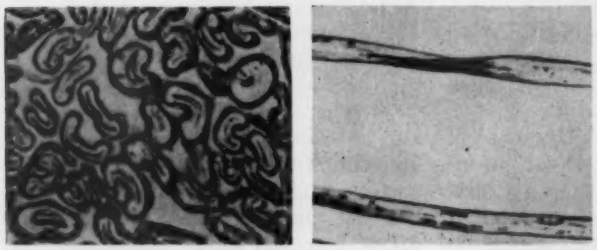
SPANDEX: Lycra, 12 den. per filament dull luster



SPANDEX: Vyrene (1), 250 den. per filament dull luster

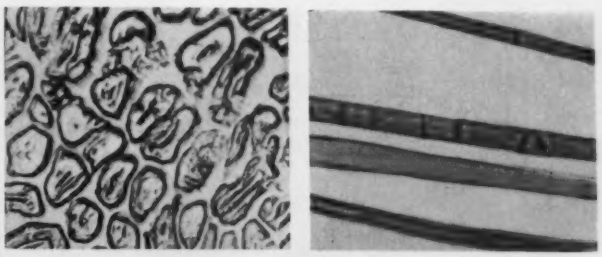


COTTON: mercerized, 1.5 den. per filament (approx.) natural luster

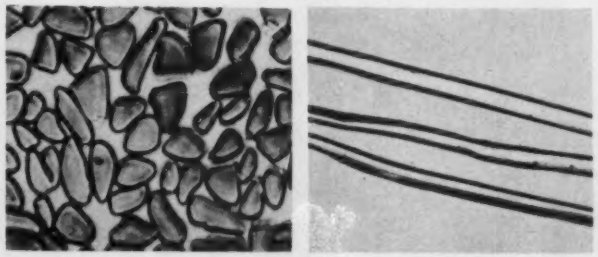


COTTON: not mercerized, 1.5 den. per filament (approx.) natural luster

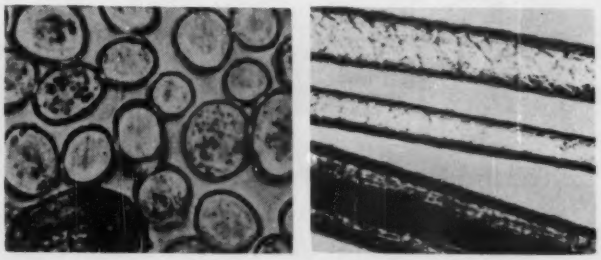
Cross-Sectional View at 500X | Longitudinal View at 250X



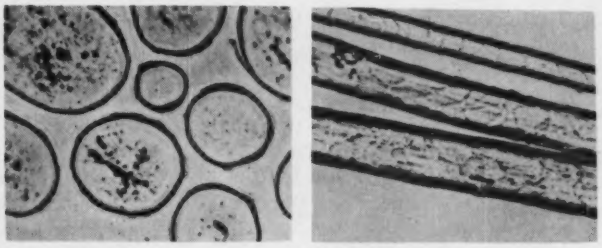
FLAX: bleached, 3.0 den. per filament (approx.) natural luster



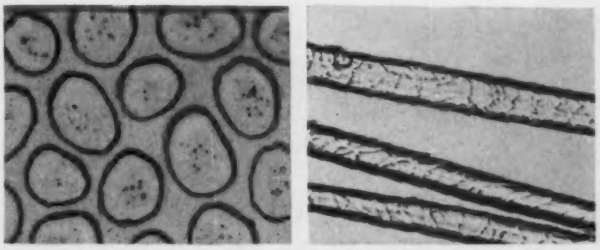
SILK: boiled-off, 1.2 den. per filament (approx.) natural luster



WOOL: cashmere, 3.0 den. per filament (approx.) natural luster



WOOL: mohair, 6.5 den. per filament (approx.) natural luster



WOOL: regular (Merino), 4.0 den. per filament (approx.) natural luster

1. Magnifications for Vyrene are as follows: Cross-Sectional view—200X. Longitudinal view—100X.

How This Small Mill Stays

Small yarn mills must fight tough competition these days to remain in business. Here's one old mill that stays young by keeping up with technological advances—and by producing its own low-cost power.

SUPERVISION of yarn quality is one of the top jobs of President J. N. Birch of Juliette Milling Co. (right) and Superintendent Floyd Hunnicutt.

CAN A SMALL independently owned yarn mill compete successfully with today's textile giants? That's a burning question for many mills these days. The answer? Listen to J. N. Birch, president of Juliette Milling Co., Juliette, Ga.

"Yes. But it's not easy. Somehow we've managed to stay in business over 60 years. How? I'd say our policy of installing the best possible machinery—regardless of cost—is the main factor. Good machinery keeps an old mill young. But we also stress quality—we're not prone to high-speed production. And our customers stay with us. We produce our own power, too—and at low cost."

MODERNIZING PAYS OFF

Juliette recently invested over $300,000 in its future. Not much for new equipment by some yardsticks. But a good round sum for a mill of this size (7,680 spindles). And the results?

- Yarn cost down 12% (1½¢ per pound).
- Yarn break factor increased 200 points.
- Ends-down reduced 15%.
- Cleaning time cut 50%.
- Power costs down 10%.

President Birch is not a man who enjoys being behind in a race, whether it be a plant-improvement race or a horse race. (Top money won by Miss Juliette, one of his prize-winning harness horses, proves the latter point conclusively.) And this ability to stay ahead is reflected in his plant-improvement plans.

For example: Juliette was one of the first mills in the country to install Saco-Lowell's radically new Magnedraft drafting system on a production basis. Why? Mr. Birch says: "We tried out several different change-overs and compared the results with Magnedraft. The latter's yarn break factor was much higher because of closer alignment of top and bottom rolls. We also like the simplicity of the system and its ease of cleaning. Our spinners say it runs well.

"But spinning is not the only improvement we've made. Other changes include new opening, drawing, roving, and big card coilers and cans. And we're quite proud of our new hydroelectric equipment, which produces power below the cost of commercial electricity."

HOW THE MILL OPERATES

Juliette Milling Co., built before 1900, specializes in the manufacture of high-quality yarns and twines. Weekly (two-shift) production is about 65,000 pounds.

Opening and picking—Yarn strength is a "must" at Juliette. This requirement makes choice of cotton vital. Staple length and fiber strength mean more than grade and appearance. Most cotton used is $1\frac{1}{32}$-in. Middling.

The company lays down 20 bales and feeds from all of them. Juliette has beefed up its cleaning line with four new No. 15 openers and a new No. 11 condenser. Present layout consists of four No. 15 openers, two No. 11 condensers, one Superior cleaner, one Southern Regional Research Laboratory cleaner, one separator condenser, and one reversing blender. One man per shift operates this department.

After cleaning, the cotton moves into three one-process Kitson pickers with blending reserves and rack controls. Three-blade back beaters run 950 rpm. with a fan speed of 1,150 rpm. Kirschner beaters in front operate at 1,040 rpm. Fan speed is 1,020 rpm. Each picker

Competitive

turns out a 13¼-oz., 60-lb. lap at 280 pounds per hour. Pickers are operated by one man per shift.

Carding — The carding department has 64 modernized cards with feed-roll compression units and 18 x 42-in. Saco-Lowell coilers and cans. Each can holds up to 40 pounds of 56-grain sliver. Production is 13.8 pounds per hour. Cards are ground 8 hours every 21 days.

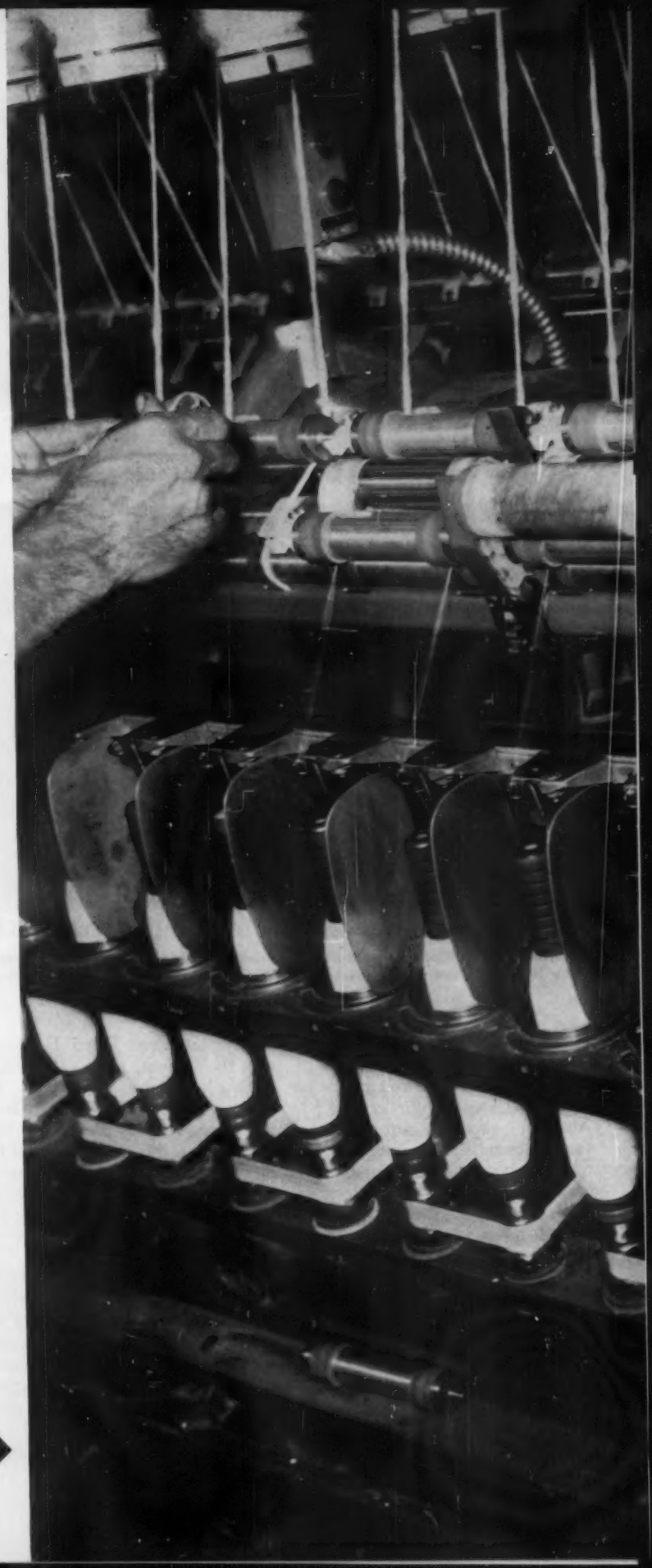
Basic card speeds and settings are: cylinder 170 rpm. (0.007 inch), doffer 10 rpm. (0.007 inch), flats 3½ inches per minute (0.010 and 0.012 inch), and lickerin 487 rpm. (0.007 inch). Two men operate all the cards.

Drawing—The drawing department recently installed five four-delivery Versa-Matic frames with four-over-five drafting. Although capable of much higher speeds, these frames are set to produce 56-grain sliver at 290 feet per minute. Delivery cans are 16 x 42. One man per shift operates all the machines.

Roving—Old roving frames have been replaced with two FS-2 and one FS-3 machines with 88 spindles each. Gage is 10¼ inches. All roving made is 0.60 hank. Weight on bobbin is 58 ounces for FS2 frames and 64 ounces for the FS3 machine. Other processing data: Back draft, 1.20; front draft, 3.36; total draft 4.03. Spindle speed, 630 rpm.; jack-shaft speed, 280 rpm.; front-roll speed, 200 rpm. Doffing cycle 1½ hours. One tender runs all frames.

Spinning—Juliette has modernized 32 spinning frames by changing over 17 to Magnedraft and 15 to Duo-Roth drafting. Both changeovers give excellent results. All frames have 2½-in. rings. Magnedraft frames are 3½-in. gage; Duo-Roth, 4-in. gage. New Parks-Cramer traveling frame-and-floor cleaners and open creels contribute greatly to reduced cleaning time—down 50%.

Frames producing an average



MAGNETIC ROLLS are the key to better yarn—and less cleaning time.

OPENING improved with four new hoppers

With the new hoppers and one new condenser, the company now removes about 10% waste (including bagging and ties.).

CARDING done with modernized units

All 64 are equipped with feed-roll compression units and 18x42-in. coilers and cans. Production is 13.8 pounds per hour.

TWISTING marked by versatility

The company uses many different machines. It plies most yarn 2 to 10 times. But it has machines to make 36-ply cord.

HYDROELECTRIC power system modernized

Three synchronized generators like this one produce low-cost electricity. Operator stops machine with hydraulic brake.

number (9.25s—64 Tex) from 0.60-hk. roving have spindle speeds of 7,400 rpm. and front-roll speeds of 170 rpm. Twist multiplier is 4.50. About 8 ounces of yarn is put on each bobbin. Total draft (15.42) for both systems is the same. But break draft differs. Duo-Roth is 1.38; Magnedraft, 2.05.

Ends-down average 30, about 15% less than before modernization. Break factor is 2,150 to 2,200 —at least 200 points higher than before.

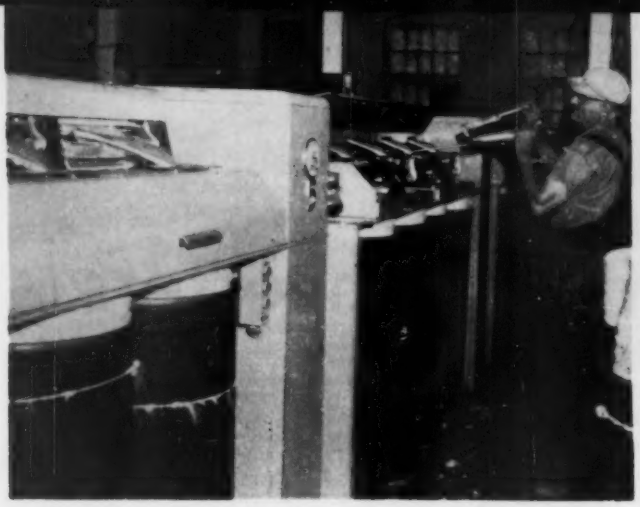
Formerly, Juliette required 7 spinners per shift . Now there are 6 spinners. Work assignments are 13 sides for 5 spinners, 12 sides for 1 spinner. The operation still needs one cleaning man.

Superintendent Floyd Hunnicutt says the spinning room runs best at 65% r.h.; on dry days, 70%. He believes that this higher-than-average humidity helps prevent lap-ups. He also says this makes it easier for the air changer to keep inside temperature at least 10 F. cooler than outside temperature during hot months. Temperature averages 75 to 80 F. the year round.

Winding and twisting—Juliette Milling has a wide variety of winders, twisters, and beamers—over 40 machines all together. The many brands used include Universal, Meadows, Barber-Colman, Cocker, and Haskell Dawes. With such versatility in machines the mill can meet almost any customer specification for warp twist (8s — 16s), soft twist (3s — 12s), plies (up to 36), perforated tubes (⅝ to 1⅝ inch), plugs for twisters, springs, cables and housers (ring and tube twist), sewing twines (regular and knotless), hand-sewing twines, tying-machine cord, wrapping twine, ball warps, and section beams.

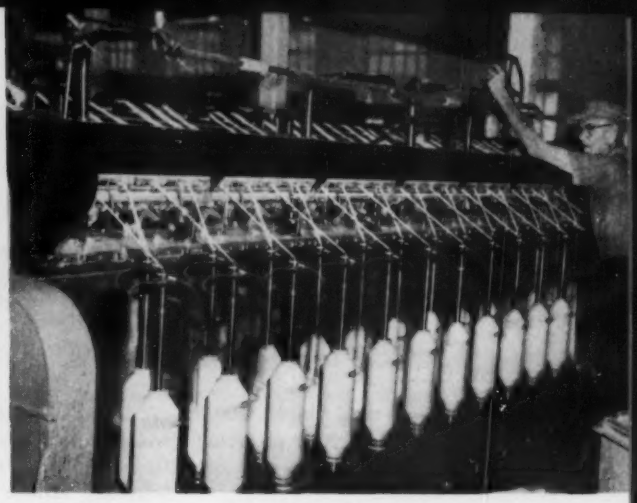
GETTING POWER AND WATER

Juliette's management is proud of its modernized hydroelectric power system. The company produces its own power below the cost of commercial electricity. And the saving is a definite factor in its ability to compete with larger companies. Main cost of power is machinery



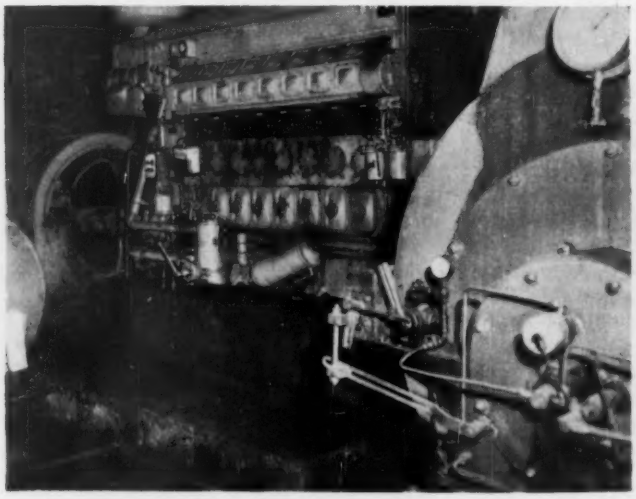
DRAWING improved with five new frames

The new four-delivery frames operate at 290 fpm., although capable of higher speeds. Juliette prefers quality to speed.



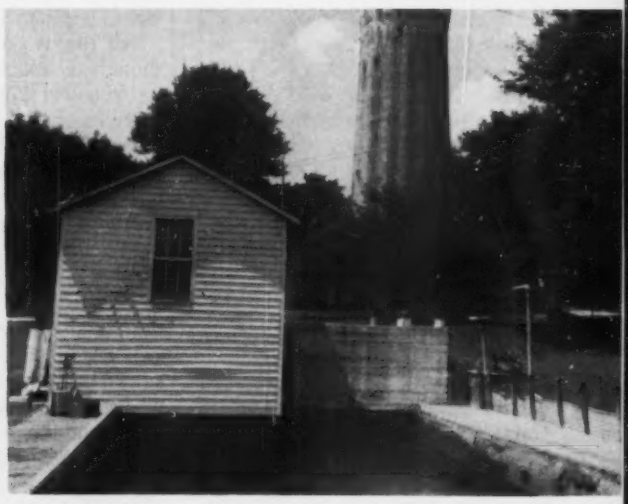
ROVING produced on new 88-spindle frames

All roving is 0.60 hank, weight on bobbins is 58 ounces for FS2 frames, 64 ounces for FS3 machine. Gage: 10¼ inches.



STANDBY POWER available

If the hydroelectric system fails, this diesel engine supplies power needs. So far, the diesel has been used very little.



FILTERING plant kept up to date

This plant purifies all water used except for a substantial reserve stored in a big standpipe for fire protection.

depreciation—about ⅓¢ per pound of goods produced.

The power system consists of three synchronized turbines and generators located in three different places on two mill races. There are two 500-hp. Westinghouse generators and one 350-hp. General Electric generator. Lespelle turbines submerged in the mill races motivate the three generators. Total capacity: 600 volts at 1,000 amperes.

If necessary, the company can cut any one of the synchronized units out of the system without interfering with mill operations. Should all three generators have to be shut down because of inadequate water supply, there are two Fairbanks-Morse standby diesel engines (375 and 600 horsepower). So far, the diesels have had to supply less than 5% of the mill's power requirements.

Juliette prides itself on its pure water supply. The filtration and treating plant pictured on these pages produces sparkling, soft water said to be equal to that supplied by the municipal systems of nearby cities. A large old-fashioned water tower (photo) is kept filled with untreated river water for fire protection.

Juliette has no earth-shaking management problems. When basic decisions have to be made, President Birch and Superintendent Hunnicutt with advice of other managers simply sit down over a "Coke" and decide. But there's one problem—loss of young people from the labor force. Most of them, finishing high school, want to move to larger cities instead of following in the footsteps of their parents, Mr. Birch says. But this condition is not confined to Juliette. Most small rural plants have the same problem.

One answer, according to Mr. Birch, is "more and more automation to replace those who retire or are no longer able to work. We have good jobs for about 125 people at present, and I hope that we shall always be able to employ those who want to work here. It's our duty to the community."

Coming: More Static Converters

SOONER than you think, static power converters may be replacing conventional electric drives in many places in your mill.

Why? Because these converters, based on the simple semiconductor switch, will provide you with a system that's marked by . . .

High efficiency in power use.

Low first cost.

Low operating cost.

Long life.

Freedom from maintenance problems that are typical of rotating electrical equipment.

Quiet operation.

Accurate frequency control — therefore accurate speed control.

Good frequency stability.

HOW THEY'LL HELP YOU

What do these static power converters do? Where do they fit into your mill?

Basically, they provide an a.c. power output tailored to your special needs. You can control the frequency of this output over a wide range, and its stability will be dependable and constant. This means that these power converters will fit into several places in your mill. To mention a few:

. . . *Spinning machines* (man-made fibers), where you need accurate control of low-horsepower synchronous reluctance and hysteresis motors, and where small groups of motors run at different speeds.

. . . *Winding machines,* where you need soft or quick starts.

. . . *Lighting,* with incandescent, mercury-vapor, or fluorescent systems, where you need to eliminate stroboscopic effects and reduce the size of components in the lighting auxiliary circuits.

. . . *Space heating and drying,* where converters can operate constantly at frequencies that will substantially reduce the size and cost of heating equipment.

The truth is, the power-handling capabilities of these little semiconductors—these little switching devices—are increasing fast.

All this is good reason why you should get interested right away in static power converters as possible replacement for rotating converters in your mill. They are easy-care items. They are static. They are miniature. And if they can't yet do every power-conversion job in the book, they can handle many a job with high efficiency.

How they work—Basis is the semiconductor switch. These switches include germanium and silicon transistors of the PNP (positive-negative-positive) and NPN types and controlled rectifiers (or Trinistors) of the NPNP type. Today, they are capable of high efficiency controlled switching. Thus they are opening new possibilities for d.c.-to-a.c. conversion devices.

Why is this important? Because in man-made fiber spinning operations, for example, changes in speed of induction or synchronous motors have to be accomplished by frequency changes between the available power supply and the driven motors. Up to now, this has nearly always required additional rotating equipment—usually cumbersome and costly. The growing need for wide frequency ranges and high-frequency stability has further complicated the problem.

In an inverter (d.c.-to-a.c. converter) built of these static switches, the semiconductors switch the d.c. output on and off in sequence to produce an a.c. output. For instance, take a simple arrangement of six semiconductors, $S_1 - S_6$ (facing page, top left). With sequential switching these will produce a 3-phase output in lines R-Y-B. If you switch the two semiconductors in each leg in contraphase, and if there is a displacement of 120 degrees from each of the three legs to the next, then you'll get a voltage with a line-to-line waveform (facing page, top right). This waveform is almost sinusoidal.

Several things are notable about what happens here:

. . . *It's simple to make the phase spacing exactly 120 degrees.* It's done by semiconductor logic circuitry. Frequency stability of the a.c. output is as good as the stability of the gating drives. You can derive gating drives from a single low-power, high-stability oscillator followed by one or more simple amplification stages.

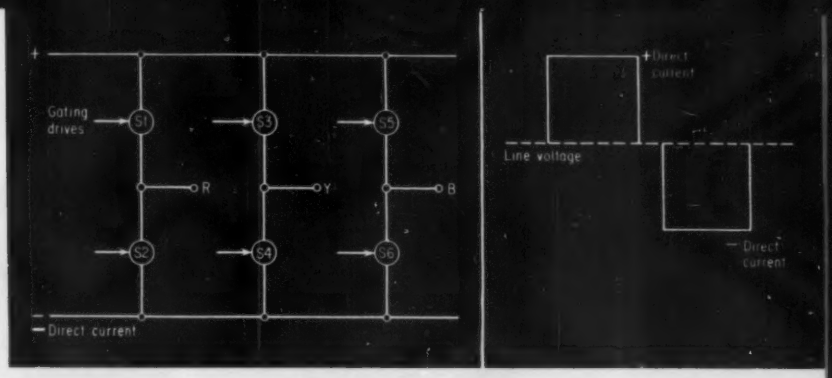
. . . *Efficiency of power inversion (d.c.-to-a.c.) runs close to 90%.*

. . . *Noise is negligible and there are no moving parts.*

. . . *You can regulate output voltage* by controlling the d.c. voltage, or by attaching variable-voltage transformers to the output, or by controlling the firing times of the semiconductors.

Why a.c. to d.c. to a.c.? There are time-honored ways of changing the frequency and voltage of alternating current. But with devices having power-handling capacities of several kva., and with installations where a variable frequency output is desired, it is often best to rectify a.c. and then reconvert it to the voltage and frequency you want. In this operation static power converters will give you long-term stabilities of better than 0.1%. In fact, you can control the d.c. voltage itself by semiconductor switches in the rectifier. What's more, you can vary voltage with frequency so the unit will act as a drive for motors operating at constant torque and varying speeds—the synchronous reluctance type of motor, for example, common in fiber-manufacturing.

By IAN MacDONALD, Engineer
Systems Control Department
Westinghouse Electric Corp.
Buffalo, N. Y.



SWITCHING through these semiconductors . . . . produces precise-frequency a.c.

The kind of semiconductor you select for a power inverter is largely a matter of cost and power output required (table below).

• **Germanium and silicon transistor switches** are easy to control. But their power-handling capacities are limited, and you need a lot of paralleling to use them above the 5-kva. level.

• **Trinistor-controlled rectifiers** present the brightest promise as the basic switches in static conversion units. Their ultimate capabilities are much greater than those of transistors, especially in higher ratings. The price of Trinistor-controlled rectifiers has fallen a good deal during the past year, and may keep on falling. The gating power required to switch on the device is much less than for an equivalent transistor unit. To turn off the device you must reverse the voltage across the Trinistor-controlled rectifier or reduce the current through it to zero. But the circuit for doing this is, in essence, time honored. These rectifiers can also be simply protected against overload and fault damage.

At the start, some work was done with transistor inverters in building two germanium-type converters—one with 9-kva. capacity; the other, 18-kva. These units are installed in fiber-manufacturing plants as power supplies for variable-speed drives. The two prototype installations helped to point out design problems associated with such drives and to indicate solutions.

STILL SOME PROBLEMS

For instance, commutating of semiconductor switches—especially when dealing with inductive loads—calls for special circuits to take care of the widely varying load, frequency, and power-factor conditions and also the oscillatory (even possibly regenerative) power associated with motor loads.

Again, short-time overload capabilities of semiconductors are below those of a machine. This means that sensing must be fast to protect the equipment. Otherwise the equipment must be designed to withstand overloads for a definite time.

Finally, by most measures static power converters are new. This means equipment designer and user must work together to insure satisfactory, economical performance. For instance, large inrush currents impose a severe requirement on the converters when rotating equipment is started direct on line, because the currents may last several seconds before synchronism is reached. Procedure: Attack the problem not always in the inverter itself but in the place where the answer will come easily and economically. In spinning, for example, hysteresis-type motors (low-inrush starting current) would make it unnecessary to overdesign the inverter.

WHERE SUCCESS LIES

Merits of these static power converter systems are many:

• Easy-handle packages—The static converter can be small enough to mount beside a small group of motors. This means no more central machine room. You can vary speed by turning a potentiometer located almost anywhere. Load changes don't affect the master oscillator.

This means two things: (1) Frequency does not change with load, and (2) transient response of the system is fast. It's easy and inexpensive to add frequency modulations on base speed. It's also easy to check stages in the drive for malfunctions and to unplug a faulty stage and plug in a spare.

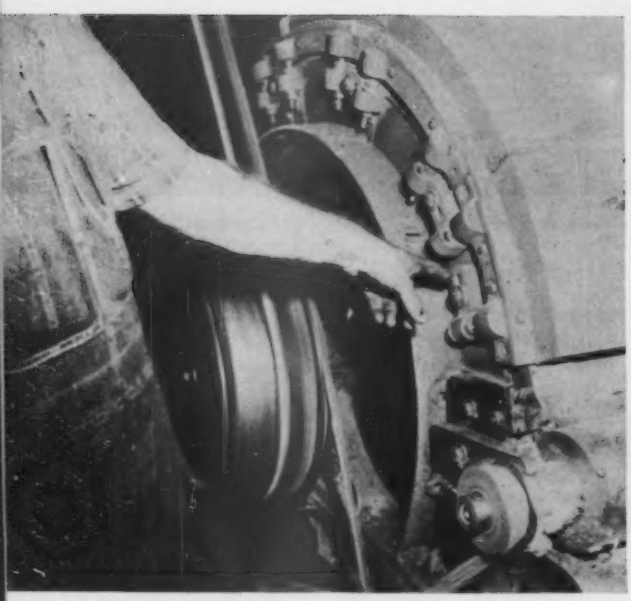
• Good control—With switching speeds in the order of microseconds, high output frequencies are easily obtained and high-speed rotary motions follow naturally.

• Resistance to damage—Mill men charge up most motor and control troubles to dust, high temperature, humidity, acid and caustic splashes, corrosive fumes, and vibration ("Electric Power in Textiles—1961: A Survey Report," TEXTILE WORLD, January 1961, page 62). Static converters promise help in these problems. Components of static converters are mounted on printed circuit boards. Spraying them with an epoxy-type air-drying varnish will protect them against fumes, against humidity up to 100%, against a 3 to 5% salt spray, and against vibrations of 1,200 per minute up to 10-million vibrations.

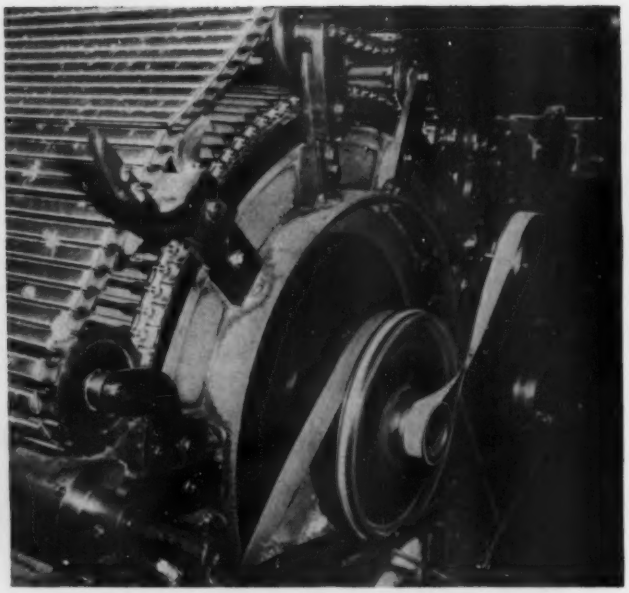
Maximum component temperature ranges up to 150 C. But units can operate at high ambient temperatures. Forced-air cooling is seldom needed.

How Static Power Converters Compare

Unit	Maximum Volts	Maximum Amps	Maximum Junction Temperature	Power-Switched Gating Panel
Germanium transistor	100	30	90 C	1.5×10^3
Silicon transistor	300	30	150 C	10^3
Trinistor controlled rectifier	400	100	150 C	10^6



CLEANER WORK—Granular top bolted over cylinder keeps fly inside. Top comes off when sandpaper needs replacing.



LESS WEIGHT—Flats and other items on this conventional card weigh 1,000 pounds. New tops weigh about 200 pounds.

Will Flatless Carding Pay Off

Here's a case-history report from one yarn mill that has reduced waste and cut labor costs without lowering quality. How? By installing granular top change-overs—flatless carding.

CHANCES ARE you'll like granular carding (no flats) if your mill produces coarse goods. You'll find it more useful than do mills that produce fine goods. Flatless carding also works well on man-made fibers. Chief complaints heard are from mill men who say it makes too many neps. But it's now accepted practice in an increasing number of plants. Just 3 years ago, it was only a bright idea in the minds of researchers at the Southern Regional Research Laboratory.

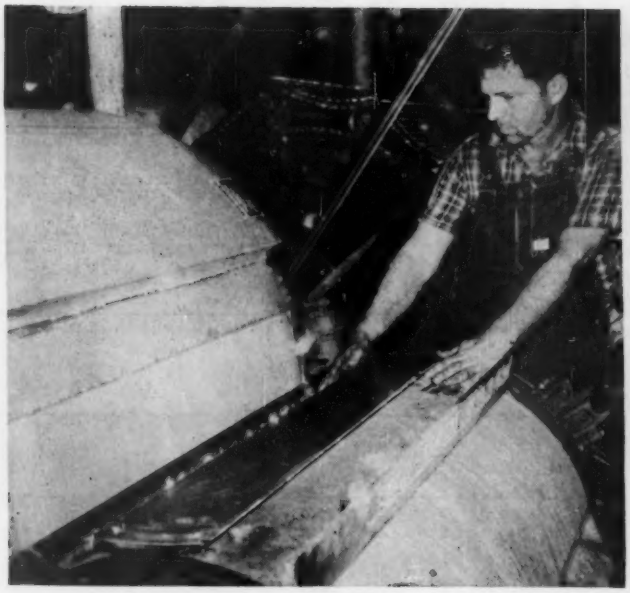
One mill that likes granular carding is Quaker Meadows Mills, Inc., Hildebran, N. C. It has 10 granular tops operating and plans to install more as fast as flats wear out. Maybe Quaker Meadows' experiences will help you decide whether flatless carding is for you. Listen to Superintendent Bill T. Walker present the facts and figures:

"We make coarse yarn and twine from low-grade cotton that is frequently blended with card strips and comber noils. At times we process 7 or 8 mixes, although we try to keep the number to 3 at any one time. This type of stock naturally generates considerable fly and waste—close to 5% on our conventional cards. Our granular tops cut this waste in half. And the card room is much cleaner because fly is sealed within the card. The elimination of flat strips reduces waste and handling. Neps are no problem.

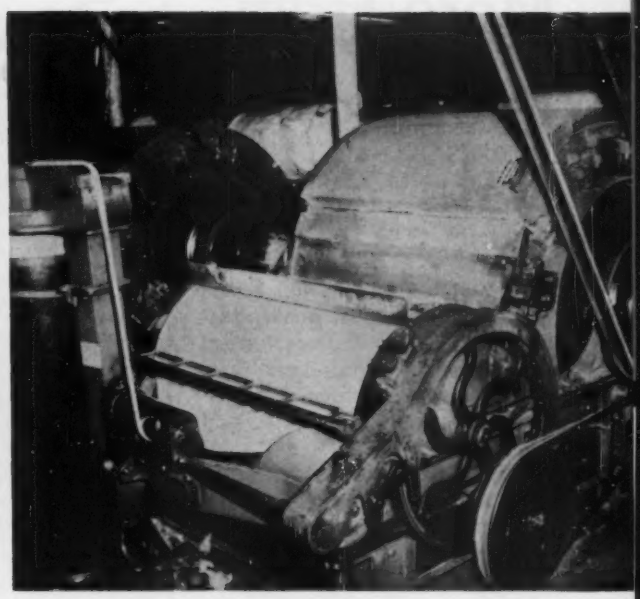
"Another advantage is the simplicity of the mechanism. It's a fixed piece of metal with a 'sandpaper' lining that replaces the flat assembly and flexible bends. It weighs about 800 pounds less than the assembly it replaces. There are no moving parts. Our tops are different from others in that the fourth cover has been reduced in width to permit continuous stripping. After removing flats we can install units in 3 to 4 hours. Top comes off easily when we replace sandpaper.

"It's cheaper to buy granular tops than to reclothe flats—if you sell your old flats. Our granular tops cost about $100 less than recloth-ing after deducting the resale value of the flats.

"We save considerable labor because there are no flats and flexible bends to grind, no flats to oil and clean, no preopener roll to worry



EASY INSPECTION—Cylinder is inspected by plate lowered above doffing, as shown. Cylinder is ground here too.



BETTER SLIVER—Sliver produced compares favorably with conventional cards. Production: 12 pounds an hour.

in Your Mill?

about. Grinding time is reduced, less blowing off is needed.

"We use the Micro-Grind system on granular and conventional cards. We grind four cylinders a day on a 20- to 21-day cycle. This system has cut our grinding time from 8 hours to 45 minutes per card, and we need one less card grinder. Another dividend: Sharper wire has cut power cost 20%.

"Granular-top maintenance cost is negligible because there's nothing to wear out except sandpaper. Operating cost is zero: No power needed, no flat-strip handling.

"New sandpaper costs about $16 per card installed. It was originally estimated that it would wear out in 6 months. Ours lasts up to 2 years. But we do examine it periodically to be on the safe side.

"Speeds and settings are about the same as for conventional cards, dictated by production requirements. Our average speed is 12 pounds per hour. Sometimes we run as fast as 14 pounds per hour."

LESS TIME—Grinding time cut from 8 hours to 45 minutes with this high-speed equipment. Results: One less card grinder and a sharper wire.

More From Ends-Down Data

ARE YOU GETTING full benefit from your ends-down quality-control program? To find out, look at your routine ends-down data.

In addition to information on operator assignments, incentive, and quality, the data also supply valuable information on the effect of fibers, settings, and equipment.

An even closer analysis, requiring only 2 or 3 hours a month, will show a performance rate by individual frames. With this, you can:

- **Reduce ends-down and cost** by isolating frames with high rates.
- **Improve over-all spinning-room efficiency** by checking frames with low ends-down rates and finding out why these frames run better.

Usually you review ends-down rates daily, weekly, or biweekly, and compare ends-down of various yarn counts and frame types. You can then base corrective action on rates observed in spinning.

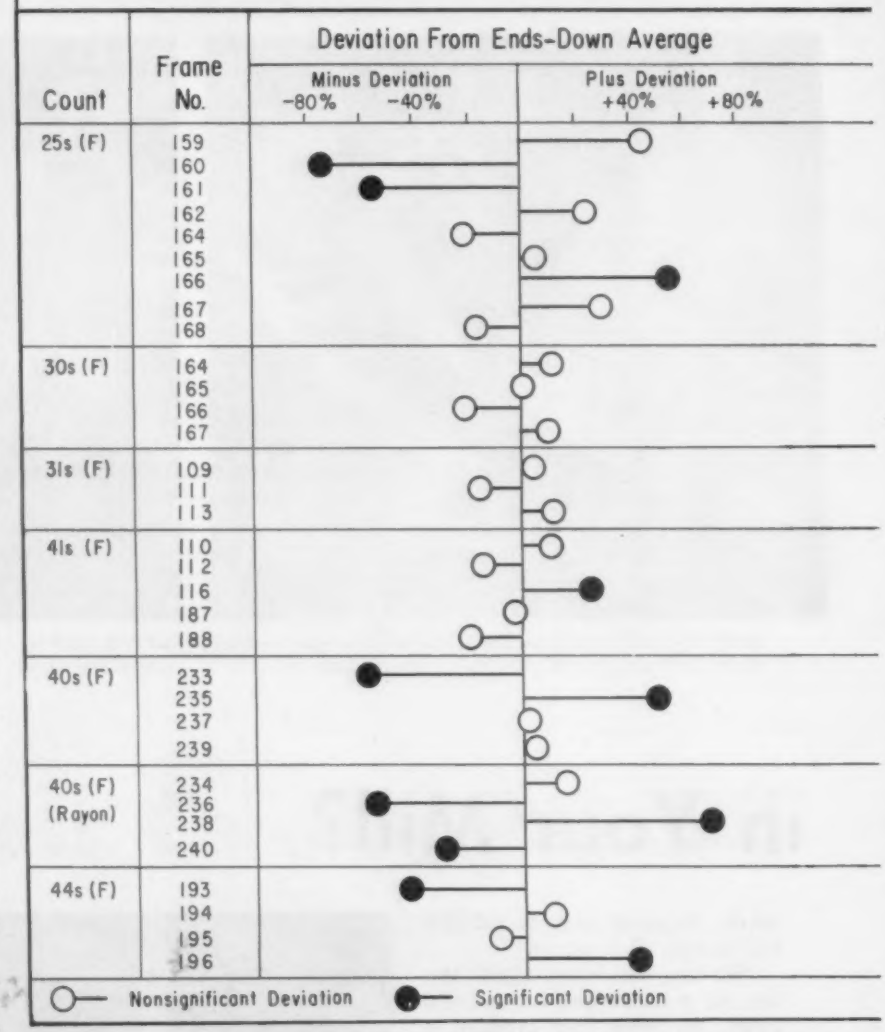
Recently this writer analyzed a large amount of ends-down data by yarn count and frame number. The results were amazing. While most frames were at a fairly stable "average rate," some frames deviated markedly from this average. These data are illustrated in the table.

On 25s filling, for example, Frame 159 showed a rate of 65.6 per 1,000 spindle hours. Yet the average for nine frames on this yarn (all identical frames assigned to the same operator) was only 26.6. Clearly, Frame 159 was 46.6% higher in its ends-down rate than the over-all average for the count. But Frame 160 was 73.7% better than the average, with a rate of only 7.

By NORBERT L. ENRICK
(Formerly Institute of Textile Technology) Associate Professor
School of Business Administration
University of Virginia
Charlottesville, Va.

How to Plot Frame Deviation

Spinning ends-down per thousand spindle hours by yarn count (filling and warp) and frame.



Data in this table are based on the student work of R. J. Tisdale, formerly a graduate student working with an Institute of Textile Technology member mill. Data reproduced by permission of the mill and ITT.

Each set of data represents about 2 weeks' observations of 2 hours a day. But you *could* use work sampling in place of continuous 2-hr. observations ("How You Can Get More From Your Work Sampling," TEXTILE WORLD, November 1961, page 52). Those frames that were significantly better and those significantly poorer would be clearly apparent. (You must determine significant differences for each yarn count.)

Corrective action—Obviously you need it on frames that show high ends-down rates (black circles on plus-deviation side of table). You should carefully check roll run-outs, roll settings, creels, bearings, and general alignments. You can improve the over-all rate by correcting the offending frames.

You should also check frames with significantly lower-than-average rates (minus deviation side of the table). Maybe, for example, a slightly off-standard setting has resulted in better performance than you would expect. Accidental deviations from standard practice have often led to interesting discoveries —and better products. Similarly, spinning frames running at spectacularly lower ends-down rates deserve a check to see whether you can isolate the favorable factor. You can then adapt this new factor to all your spinning frames.

Southeast Cotton Crop: Poor

Too much rainfall on open bolls caused deterioration in nearly all early-season fiber properties this year. Cotton growers in the area are now pinning their hopes on signs that late cotton may be better.

A MARKED decrease in yarn break factor—caused by weaker fiber—stands out in an evaluation of the 1961 Southeast cotton crop. On the whole, grade, manufacturing waste, and neppiness are worse than last year. Why? Excessive rain.

State by state, Georgia fared best. Yarn break factor is lower, but not as low as it is in South Carolina and Alabama—where it dropped 400 to 700 points. Fiber strength and grade compare favorably with the 1960 crop and the 5-yr. average (see table). So does manufacturing waste.

Fiber strength is 'way off in South Carolina and Alabama. And grade in these two states is off nearly 10%, compared with last year and the 5-yr. average.

Micronaire values hold up in all areas of the Southeast, and yarn appearance is actually better than last year's index.

If favorable weather prevails for late harvesting, unopened bolls are likely to produce more normal cotton. Even so, extra care will be needed in harvesting and ginning methods to preserve quality.

By F. L. GERDES
Cotton Technologist
USDA, Retired
Leland, Miss.

Here's How Early-Season Southeast Cotton Stacks Up . . .

. . . IN SOUTH CAROLINA

Properties	1956	1957	1958	1959	1960	1956-1960 Average	1961
Grade index	98	100	100	100	100	100	92
Staple length (1/32 inch)	33.4	33.5	33.8	33.6	34.0	33.7	33.0
Upper-half mean length (inches)	1.06	1.04	1.03	1.05	1.09	1.05	1.02
Micronaire value	4.0	4.3	4.1	4.3	4.5	4.2	4.2
Tensile strength (1,000 psi.)	78	84	78	76	79	79	76
Manufacturing waste (%)	7.5	6.6	7.5	8.2	7.2	7.0	8.8
Neps (per 100 square inches of card web)	12	14	21	15	17	16	21
Average break factor	2,450	2,420	2,360	2,270	2,260	2,350	1,640
Yarn-appearance index	104	105	100	104	104	103	112

. . . IN GEORGIA

Properties	1956	1957	1958	1959	1960	1956-1960 Average	1961
Grade index	101	99	101	101	100	100	100
Staple length (1/32 inch)	33.1	33.5	33.9	33.4	34.0	34.0	34.0
Upper-half mean length (inches)	1.03	1.05	1.06	1.07	1.07	1.05	1.02
Micronaire value	4.1	4.2	3.9	4.5	4.5	4.2	4.2
Tensile strength (1,000 psi.)	77	82	78	81	81	80	82
Manufacturing waste (%)	8.8	7.9	6.9	7.6	6.7	7.7	7.5
Neps (per 100 square inches of card web)	22	13	19	25	13	18	30
Average break factor	2,380	2,400	2,370	2,380	2,345	2,380	1,950
Yarn-appearance index	97	102	104	114	108	105	112

. . . IN ALABAMA

Properties	1956	1957	1958	1959	1960	1956-1960 Average	1961
Grade index	100	102	101	101	100	101	91
Staple length (1/32 inch)	33.2	33.0	33.9	33.5	33.4	33.4	34.0
Upper-half mean length (inches)	1.02	1.03	1.08	1.03	1.04	1.04	1.06
Micronaire value	3.9	3.9	4.2	4.6	4.6	4.3	4.4
Tensile strength (1,000 psi.)	79	83	76	80	82	80	72
Manufacturing waste (%)	7.6	6.8	7.2	7.3	7.2	7.2	8.4
Neps (per 100 square inches of card web)	15	19	15	20	17	17	18
Average break factor	2,360	2,350	2,210	2,350	2,250	2,300	1,707
Yarn-appearance index	99	101	104	108	107	104	115

Textile Men Jam Two TOE

IN GEORGIA:

Metallic Card Clothing Looks Good

EARNEST mill men listen intently as speakers point up carding and spinning problems. Carding discussion was led by J. L. Lanier Jr., West Point Mfg. Co.

MILL RESULTS from using metallic card clothing keynoted the fall meeting of the Alabama Textile Operating Executives at Auburn University. For the second year in a row, Alabama mill men thrashed out the pros and cons of metallic card clothing—and the subject today is hotter than ever.

This year 18 mills gave full details of their experience on a production basis over a period of months and years. You can get a typical sampling by looking at the chart (see below). But the end result boils down to this: Most mills reported . . .

- **Fewer neps.**
- **Reduced flat strips.**

How Metallic Clothing Affects Carding

	Mill A	Mill B	Mill C
Number of cards	66	108	126
Cotton	1 1/32-in. M	1⅛-in. M	1-in. M 1 3/32-in. SM
Sliver weight (grains)	55	59	60
Wire	Hollingsworth	Hollingsworth	Hollings- Ash- worth worth
Cylinder	35	35	35 301
Doffer	29	29	29 PA65
Length of time used	6 months	5 years	8 cards (1 year) 118 cards (6 months)
Type of journal	Reworked	Reworked or replaced	Replaced when scored or when wear exceeded 0.003 inch
Feed rolls bolted down	Yes	Yes	Yes
Stripping schedule	120 hours	2 weeks	120 hours
Cleaning schedule	Twice per shift; blow down weekly	Pull chokes—2 weeks; blow out when fronts are set	Mop—24 hours; wipe fronts and backs twice per shift
Grinding schedule	When needed	When needed	Only when wire is damaged
Setting schedule	30 days	Fronts and flats—3 months; backs—6 months	21 days; check when needed

	Mill A	Mill B	Mill C
Maintenance problems	None	More chokes; piling on doffer selvages	More fly and chokes
Sliver uniformity	Slightly better	CV 25% lower	30% better
Neps	50 to 60% fewer	50% fewer	50% fewer
Trash in sliver	25% less	—	Less
Reduction in flat strips	10%	—	53% on M cotton 42% on SM cotton
Choke preventive methods	Bowed back plate	Antichoke rubbers on sides of doffer and cylinder	Changed settings
Amount of fly	Up at cards; no more at other processes	Up some	More at cards
Yarn weight increase	None	—	Slightly heavier
Production increase (pounds)	6.9 to 9	None; better quality	None
Labor eliminated	2 grinders 3 strippers	Fewer grinders	$325 per week saved
Cost savings (per pound)	0.25¢	0.36¢	0.23¢

Meetings in the Deep South

- **A substantial reduction in labor costs**—from 12¢ to 36¢ a pound.
- **Less trash in sliver.**
- **More even sliver.**

Chief problem: maintenance headaches resulting from chokes and increased fly at the cards and in succeeding processes. Mills with these problems usually run low-grade cotton. And several mills reported one solution: You can decrease chokes and fly by placing anti-choke rubber strips along the sides of the cylinder and doffer.

To reduce neps, some mills advised using split-type and hardened-point wire on flats. Very few had increased card production.

USING NYLON TAPES

At the spinning session most mills reported favorably on nylon tapes. They said the tapes last three to five times longer than cotton tapes and cut power requirements in varying degrees. One mill saves $5 per year per frame in decreased power costs. Disadvantage: faster lint build-up.

Spinning trend in Alabama: high-speed travelers on warp yarn. Mills pointed out good results at spindle speeds up to 12,000 rpm.

Several Alabama mills have adopted cycle spinning, with work assignments ranging from 3,000 to 4,000 spindles per operator. Block creeling is not yet popular though. Most mills indicated that they prefer to have spinners creel as they patrol the frames.

IN ALABAMA:

Human Engineering Sparks Interest

NEW ways of handling people stole the spotlight at the annual meeting of Georgia Textile Operating Executives at Georgia Tech this fall. Over 250 weavers who came to swap experiences in the best ways to handle machines wound up discussing the best ways to handle people. And the subject—human engineering—was a brand-new one at a Georgia TOE meeting. Chief subtopic: employee group meetings in the mills.

CHALLENGE for better management was asserted by G. H. Smith, general manager of Pepperell Mfg. Co., warning that world conditions will bring difficult demands.

MEETING WITH EMPLOYEES

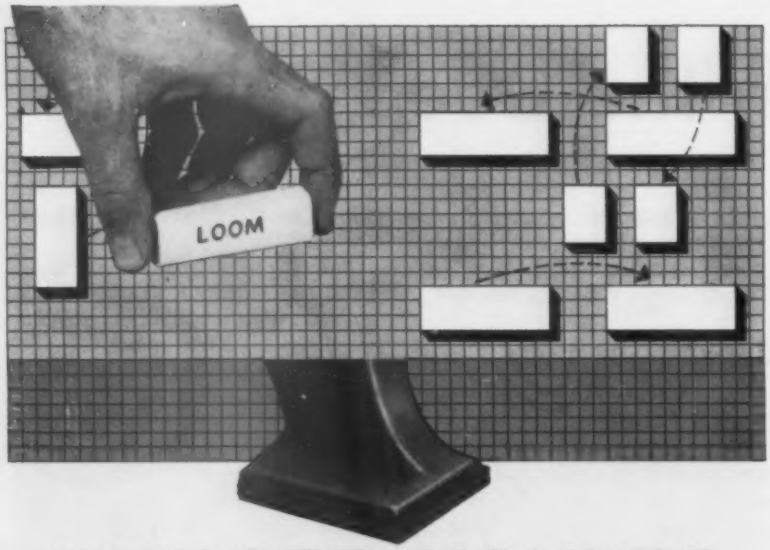
Questions of the moment: Does your mill have small group meetings with employees to discuss quality, production, safety, changes, etc.? How often are meetings held? Who conducts them?

All but three of 17 mills present hold group meetings that go all the way down the line to weavers. Mill management men direct the meetings, with most of the actual meeting conducted by department heads.

Group meetings held by mills have two objectives: (1) to get mill policies across to employees, and (2) to provide top management with feedback from employees.

This way management men get a chance to pass their ideas along to all skilled employees in the mill at regular intervals. Meeting schedules vary: Some mills hold regular daily and weekly meetings, others have them once every three months. Most mills have these meetings for open discussions of many topics—production, quality, safety, employee problems, mill policy changes, and style changes.

. . . *Turn the page*



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FE 9-69

TEXTILE MEN JAM TWO TOE MEETINGS

. . . Begins on page 70

Here's how one mill manager handles his meetings for best results: "We conduct regular meetings with weavers and loomfixers. We point out fabric defects—increases and decreases. Then we ask for suggestions to improve our position. Meetings are held every two weeks, but more often if necessary. Shift supervisors conduct the meetings. Departmental safety meetings are held each month with a team of four people from each shift."

MEETING CUSTOMER NEEDS

Another mill points out that it has held similar meetings for four years. But its theme is customer's complaints. This mill has weaverooms on three floors. And all loomfixers from one floor meet for 15 to 25 minutes each week. Weavers meet in groups of two or three, also for 15 to 25 minutes.

Shift supervisors do most of the talking. But employees like the meetings because they get a chance to learn what's going on and to explain their problems.

The weavers concentrate on fabric quality, especially fabric defects returned from the cloth-inspection department. Other meetings are attended by top-level men from all mill departments.

EMPHASIS ON MANAGEMENT

A second significant development at the meeting: increased emphasis on top-management subjects.

Future changes in technology, the weavers were told, will come in applied electronics and atomic energy—even though applications thus far have been limited. Present changes, the speaker noted, are evident in most man-made fibers available. Other technological advances were also discussed in the talk written by John P. Baum, vice president, Woolen & Worsted Division,

J. P. Stevens & Co., Inc., Milledgeville, and given by G. H. Smith, general manager, Pepperell Mfg. Co., Lindale.

SOLVING MILL PROBLEMS

Although overshadowed by the people-handling discussions, technical problems did generate some interest. Take a look at some of the facts presented:

• *Rules for reducing hard and soft yarn waste at slashers are easy and simple to follow* The key: the short run-out beam. When this yarn is gone, you've lost all other beams. Solution: Keep the creel beams running freely and be sure you have the same tension on all creel beams.

• *Mills have licked the big problems in sizing yarn and are now concentrating on small details.* Eliminating static from sized warps wasn't even considered a couple of years ago. Now mills are going all out to reduce or eliminate static for better-running warps at looms. Suggested remedies: Holding moisture content of dried warps to 6 to 6½%, being sure not to overdry the yarn, and using static eliminators (manufactured instruments). The latter appears to be the ultimate answer. But don't overlook stretch—over 2% stretch makes for bad weaving. How can you check? Use stretch meters.

• *In weaving, mills are turning to Hunt let-offs on both Draper and Crompton & Knowles looms with satisfactory results.* There's no trouble in controlling the let-offs on either light or heavy fabrics within the gearing range.

Looms with let-offs in eight mills are 40- and 44-in. Model-E running 164 ppm., C&K 60-in. C-3 at 142 ppm., 36-in. Model-E at 175 ppm., 50-in. X-D at 175 ppm., and 54-in. X-P Special at 160 ppm.

Some advantages: You can change styles fast. Action is even, cloth is uniform. Warps are pulled over easily. There's little maintenance. Little weaver attention is required. And humidity changes don't affect letting off.

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TEXTILE WORLD
Vol. 111, No. 12
December 1961

CHEMICAL TREATMENT AND FINISHING

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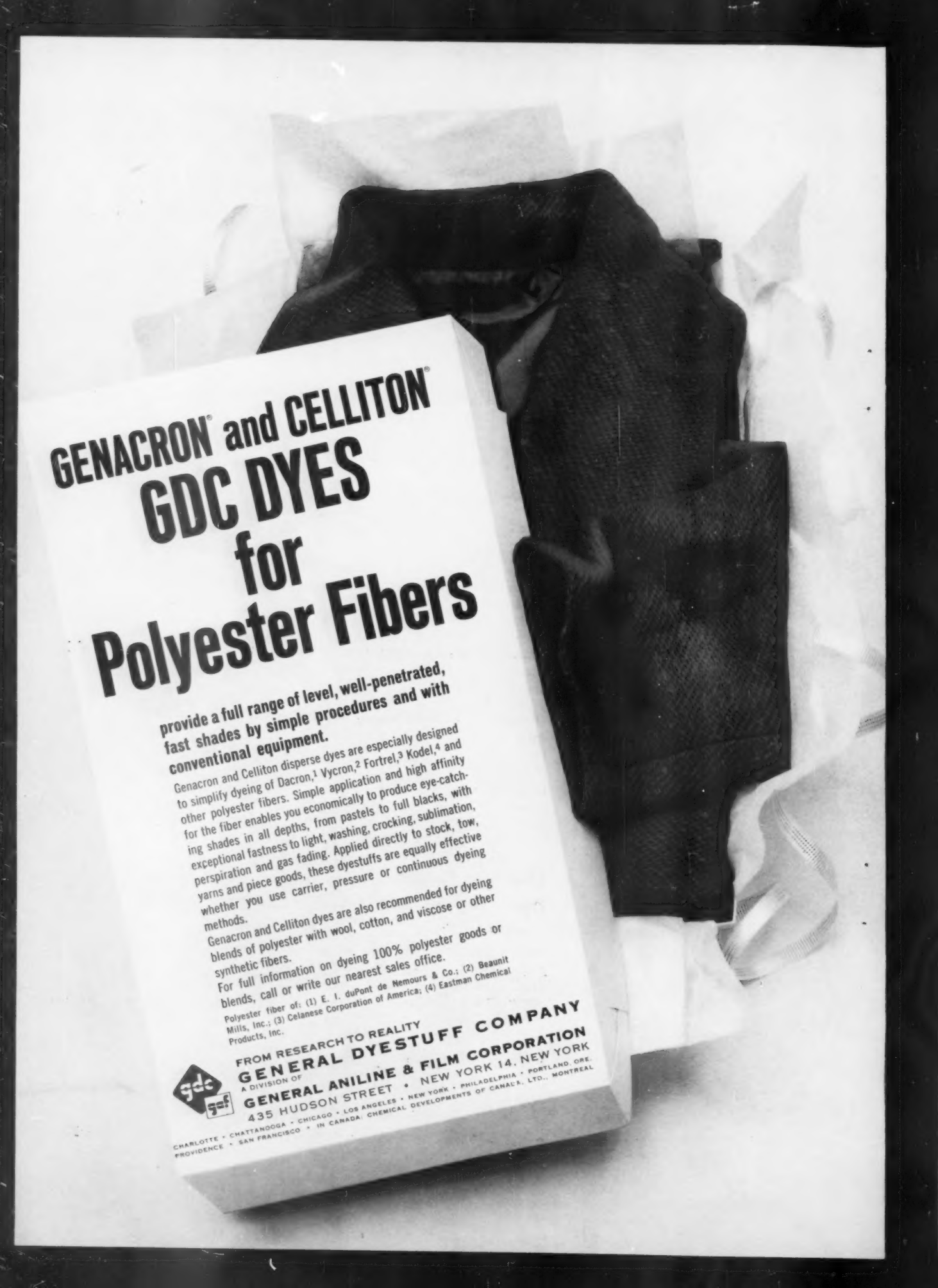
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News of the Month in . . .

Textile Chemicals

By ROBERT W. PINAULT, Associate Editor, TEXTILE WORLD

Reactive-Dye Retarders May Help Your Wool-Cotton Unions

If you're having trouble getting solid shades on wool-cotton blends with reactive dyes, maybe you can level the differences with one of the several retarding agents now available.

Retarders are based on salts of naphthalene sulfonic acids, condensation products of formaldehyde with naphthalene sulfonic acids, sulfurized phenols, alkylated benzene sulfonic acids, and certain sulfonated oils and fatty alcohols.

In a typical dyeing process, you dye a wool-cotton fabric in a bath with one part reactive dye and one part of a retarder, such as the sodium salt of an isopropylated naphthalene sulfonic acid.

Work goods for 15 minutes cold, then add Glauber's salt to exhaust the color. Add trisodium phosphate 15 minutes later to complete fixation, which takes about 1 hour.

Wool-Like Warmth— Cotton Research Goal

An all-out attempt is being made to develop winter-weight cotton fabrics that retain wool-like warmth, hand, and appearance during wear and after laundering. Harris Research Laboratories, Washington, D. C., will run the project under sponsorship of the National Cotton Council.

Chemists expect to find some "wash-and-wear" chemicals valuable in the new research effort.

Theory: If you can retain the loft of cottons designed for maximum warmth, the fabric will approach wool in warmth retention. Poor recovery of normal cotton fibers spoils this effect.

Chemists are exploring resins and crosslinkers that, when cured in the original fluffy finish, will overcome resistance to crushing.

Now—Acrylics That Don't Deluster

You can get acrylic fibers that resist delustering in boiling dye solutions because of haloalkyl phosphates in the spinning solution.

Du Pont has patented the process using tris (2:3-dibromopropyl)-phosphate, tris (2:3-dichlorethyl) phosphate, tris (chloroethyl) phosphate, and tris (dibromoethyl) phosphate.

Add 5 to 15% of such products to the mix, or as the active ingredient in a wet treatment for the freshly formed fiber. Results? Normal polyacrylonitrile fibers lose 55% of original luster if boiled for 10 minutes. Phosphate-modified fibers lose only 10%.

One-Bath Process Dyes Dacron-Cotton

You can pad on a mixture of reactive dyes (for cotton) and organic pigments (for Dacron), follow with Thermosol, and dye both fibers of Dacron-cotton fabrics.

Make up the pad liquor with 20% urea and 2% soda ash plus reactive dye and organic pigment. Pad the goods at 50 to 60 C., dry them to avoid migration, then heat to 180 C. for 4 minutes. Afterwash in a bath containing a nonionic detergent and soda ash. Ciba Ltd., Basle, Switzerland, developed the process, (British Patent 877,230).

New Dye Carriers Wash Out Easily

New carriers for dyeing and printing polyester fibers have good points. They (1) are water soluble, (2) are nontoxic, (3) don't affect lightfastness, (4) don't smell bad, (5) won't spot fabric.

The carriers have excellent leveling power and work well with vat and disperse dyes. They include 2-formylaminopropionitrile, N:N-bis-(2-cyanoethyl)-formamide, N:N:-N:N tetrakis- (2-cyanoethyl)-oxalic acid diamide, N:N-bis-(2 cyanoethyl)-amine, and 3-formylaminobutyronitrile. You use about 3% of these carriers in a printing paste to speed absorption of vat or disperse dyes. Badische Anilin Und Soda Fabrik A. G., Germany, developed and patented the new products.

Diesters Are Base For New Finishes

You can get good crease-resistant finishes from diesters recently developed by American Cyanamid Co. Two of them are oxydimethylene diacetate and ethylene-bis-(oxymethylene) diacetate.

Attractive features: smaller quantities (6% vs. 15% for conventional resins), less tendency to discolor after chlorine bleaching, and less tensile-strength loss.

Preferred practice: Replace a portion of urea- or melamine-based resins with diesters. You get a synergistic effect. Typical formula: 2% of diester plus 4% of dimethyoxy trimethylol melamine. You can use the diesters alone. They also impart dimensional stability. Process the same as for older resins. Magnesium chloride is a good catalyst.

Fiber Modifications, Grafts Improve Polypropylene Dyeing

Here are two new ways to improve dyeability of polypropylene. One is based on an epoxy resin in the melt. The other is a grafting process. Both are attributed to Montecatini, an Italian firm.

In the resin process, the mix includes about 10% of the resin, which melts at 90 to 170 C. Fiber modified in this way dyes to deep shades with disperse dyes and the colors are fast to light, perspiration, and rubbing. The process improves water absorption, too. An aftertreatment at the boil with hexamethylene diamine cures the epoxy resin and improves color fastness and fabric stability (British Patent 866,920).

In the grafting process, Montecatini takes polypropylene fiber that has a small amount (0.1%) of peroxide or hydroperoxide groups and treats them with a 50-50 mixture of 3-iso-propenylpyridine and methyl methacrylate at 80 C. for 7 hours. You can then dye the fiber with acid wool dyes. The fiber gains 4 to 7% in weight by the grafting. You can also substitute 2- or 4-iso propenylpyridines or iso-propenylpyridines that have a methyl group on the heterocyclic ring. You can replace methyl methacrylate with styrene (British Patent 872,432).

Peracetic Acid, Chlorine Shrinkproof Wool

Here's a new approach to the problem of controlling wool shrinkage and felting. A. N. Davidson, in a recent issue of the *Journal of the Society of Dyers and Colourists,* reports on the use of peracetic acid in combination with sodium-hypochlorite solutions. Experiments show, the author says, the best ratio is 1 part peracetic acid to 2 parts chlorine equivalent of the hypochlorite solutions.

Immerse wool in a solution containing 0.75% peracetic acid (on weight of wool) and 1.5% chlorine equivalent from sodium hypochlorite. Treatment is cold, lasts about 30 minutes, and is completed by sodium bisulfite clearing the goods.

British Develop New Catalysts That Will Improve Tear Strength

You get better tear strength and increased abrasion resistance on cellulosic fabrics finished in wash-and-wear by using new catalysts developed by The Bleachers Association Ltd., Britain (British Patent 877,582).

Secret catalysts made by condensation of polybasic acids like sebacic, maleic, succinic, or phthalic acid with a polyhydric alcohol like glycol or glycerine. Condensates have numerous free carboxyl groups that provide the necessary acidity to catalyze resins. Too, the polyester is a plasticizer, which softens the cured resin and improves hand, tear strength, and abrasion resistance on the wash-and-wear fabrics.

A typical catalyst is based on 1 part triethylene glycol and 2 parts succinic acid. The materials are heated at 170 C. for 2 hours, then at 190 C. until the compound has an acid value of 250.

The catalyst works well with dimethylol ethylene urea (DMEU) resins on cotton, rayon, or linen to give good crease resistance and shrinkage control. About 2% of the catalyst, based on volume of liquor, is used. You can reduce the acidity of the catalyst by adding ammonia, which disappears under curing conditions and permits the catalyst to operate at normal acidity.

Swiss Process Aids Reactive Dye Fastness

Better washfastness of reactive dyeings is now possible. A new aftertreating process, developed by Ciba Ltd., Basle, Switzerland, makes insoluble traces of reactive dyes that (1) haven't coupled with the fiber, and (2) aren't removed thoroughly in normal washing.

Chemicals that do the trick include aminoplasts based on urea- or melamine-formaldehyde resins whose methylol groups may be etherified with aliphatic alcohols of low molecular weight. Certain quaternary ammonium compounds also work well, especially the trimethyl ammonium methyl sulfate of mono-stearyl-para-phenylene diamine.

The aftertreatment needs only a few minutes at moderate temperatures. You can do it by batch process or by padding.

Hydantoin Resins Curb Chlorite Fumes

You can bleach cotton or rayon at the boil with sodium chlorite and eliminate any problem with fumes. The trick: Buffer the bleach bath with dimethyl hydantoin formaldehyde or monomethylol dimethyl hydantoin. (British Patent 875,020).

At high temperatures the hydantoin compounds liberate formaldehyde, which is immediately oxidized by the chlorite to formic acid. This in turn activates the chlorite to get the bleaching job done. The bath stays at a pH of 6.5 to 8.0, so little or no free chlorite is liberated.

A typical procedure: Treat a spun-rayon fabric in the gray for 30 minutes at the boil in a 1% solution of sodium chlorite that also contains 0.125% of monomethyl dimethyl hydantoin. The buffering action keeps the pH at 7.8 to 8.0 throughout the process. An added advantage: There's an induction period before the hydantoin resin activates the chlorite, and this permits thorough saturation of the fabric and promotes even bleaching.

New Reactive Dyes Keep Coming—Germans, British Make Discoveries

German chemists have discovered that many mono-, dis-, tris-, and polyazo dyes that carry sulfonic or carboxylic acid groups as solubilizers are reactive to cellulose—if they also contain at least one aryl-urethane grouping. An example grouping: -NH-CO-O-(benzene or naphthalene). You get a chemical bond similar to this:

$$\text{Cell} - \text{OH} + \text{Dye} - \text{NH-CO-O-R}$$
$$\text{Cell} - \text{O—OC} - \text{NH—Dye} + \text{ROH}$$

In this case, R is a benzene or napthalene nucleus that you may substitute with one of the various groups used in the manufacture of dyes. These groups include hydroxyl methoxy, nitro, acylamino, and halogens.

Although the dye-cellulose compound in this type of dye is an ester, it is very fast to washing. You apply the dyes by usual alkaline fixation methods. Cassella Fabwerke Mainkur A.G., Germany, developed the dyes.

Another recent type of reactive dye depends on fluorine for its reactivity with cellulose. Such a dye is made by coupling diazotized 2:4-difluoro-5-nitro aniline with 1-amino-8-naphthol-3:6 disulfonic acid. This dye produces navy blue shades that are fast to light and washing. Apply this dye by conventional processes for reactive dyes. Imperial Chemical Industries Ltd. developed and patented this new series and holds British Patent 882,001 for its new invention.

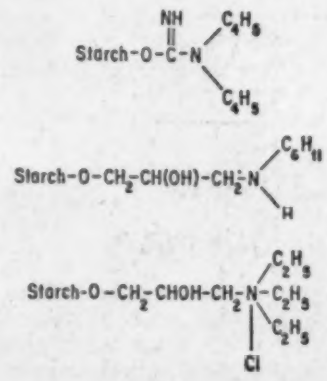
Biodegradable Syndets 'Just Over the Horizon'

Synthetic detergents that won't foul up waste-disposal systems are just over the horizon. Dr. Carroll A. Hochwalt, vice president for Research, Development, and Basic Engineering, Monsanto Chemical Co., reports that his scientists have come up with syndets that can be attacked and destroyed by micro-organisms in sewage-disposal plants.

Speaking at the dedication of Monsanto's new research center outside St. Louis, Mo., Dr. Hochwalt said that scientists produce biodegradable syndets by reconstructing the molecular structure so the product is susceptible to microbial attack. He also indicated that several major producers of syndets now have similar products in the test stage.

Substantive Starches Don't Need Boiling

You can apply a new series of starch derivatives to cellulosic fabrics by absorption. The starches don't have to be boiled. There are three types of new Corn Products Co. derivatives:



Modified starches form slurries in water. Starch particles carry a positive charge; cellulosic materials carry a negative charge. Therefore, a substantive affinity between the two exists when the goods are washed in a dispersion of the starch derivatives. Even in long baths, the company says, exhaustion is good.

Only a small number of the hydroxyl groups in corn starch, about 6 per 10,000, is substituted in the conversion process.

Did You Know . . .

. . . you can reduce the tendency of bronze powders to tarnish after printing? Try using sodium metaborate in the final rinse after soaping. The idea is based on U. S. Patent 3,000,751, concerned chiefly with the printing of bronze powders on paper treated with 2 to 6% of sodium or potassium metaborate.

■

. . . adsorbed fiber-surface contaminants on wool greatly inhibit shrinkproofing processes for that fiber? Workers at the Wool Research Laboratories of the Commonwealth Scientific & Industrial Research Organization, Geelong, Australia, find that extracting wool with ethanol will give you excellent shrinkproofing by any of several means. The treatments include applying polyamide resins or casein, or treating with reducing agents such as sodium bisulfite or thioglycolate, or with oxidants such as potassium permanganate. A full report on the work appears in the Journal of the Society of Dyers & Colourists, Vol. 77, No. 10, p. 489.

■

. . . you can prevent silk from yellowing by exposing it to ultraviolet radiation? Workers at Japan's Sericulture Research Station find that saturating silk with a zirconium-salt solution and aftertreating it with acid will cause the silk to repel the ultraviolet rays.

■

. . . abraded wool may show either lighter or darker dyeing in abraded areas? Minor abrasions effect slightly deeper dyeing in the area. If you process goods for about 4 hours, this effect may almost disappear with certain dyes. But if you continue dyeing, the abraded wool surfaces fibrillate and appear to be lighter in shade because of light diffraction. Best dyes for abraded wool are the monosulfonated level-dyeing acid dyes.

What's New in Dyes and Chemicals

Flameproofer

Flameproof 462 . . . is a durable flameproof finish for acetate, nylon, and acrylic fibers. The product is an emulsifiable clear liquid, preferably applied by exhaustion methods in the dyebath. Formula for acetate is 15% on the weight of fabric; other man-made fibers require larger amounts. You can't use this product on cotton or rayon. Apex Chemical Co., Inc. **(Write D-1 on Reader Service Card.)**

Nonionic Softener

Polasan N . . . is a low-viscosity liquid that dissolves readily in cold water. The softener is recommended as an ingredient in resin finishes to overcome brittleness and improve sewability. You can add it to resins or use it as a top finish. The product is also useful in chintz finishes, plain finishes, slashing formulas, package dyeing, napping, and heatsetting of Arnel. The softener is stable and is resistant to hard water, dilute acids, and alkalis. Onyx Chemical Corp. **(Write D-2 on Reader Service Card.)**

Cationic Softener

Polasan C . . . has a high degree of affinity for all fibers and is valuable as a lubricant in acid-fulling of wool. It disperses easily in cold water and exhausts well in long-bath applications. Recommended as a softener for all fibers, the product will not yellow. It provides antistatic protection to man-made fibers, and can be used as a top softener for resin finishes. Onyx Chemical Corp. **(Write D-3 on Reader Service Card.)**

Plastisol Modifier

Pliovic M-70 . . . imparts generally improved physical properties and heat stability to plastisol compounds. The small particle size allows wide latitude in compounding and contributes to smooth, blemish-free coatings. You can use the resin to replace a portion of a general-purpose resin in a compound without loss of quality and at lower costs. Goodyear Chemical Div. **(Write D-4 on Reader Service Card.)**

Latex

Marmix 16123 . . . is compatible with natural rubber, styrene-butadiene, nitrile, and neoprene rubbers. It's primarily a modifier that will improve the aging, hardness, tensile strength, tear resistance, and other properties of finished products or backings. Marbon Chemical Div., Borg-Warner Corp. **(Write D-5 on Reader Service Card.)**

Water Repellent

Ranedare PF . . . is a resin-based material that produces durable water-repellent effects on natural and man-made fiber. The product is also valuable in producing a soft, mellow hand on most fabrics.

Combinations of this water repellent with fluorocarbon oil repellents are effective in getting good stain resistance. You can combine Ranedare PF with resins and other textile auxiliaries to give combination water-repellent and crease-resistant finishes. Metro-Atlantic, Inc. **(Write D-6 on Reader Service Card.)**

Reactive Dyes

Remazol Yellow GR . . . gives brilliant yellow shades of high intensity on cellulosic fibers and polyamide fabrics. The dyestuff is suitable for the exhaust process as well as for conventional padding and continuous processing.

Dyeings and prints have excellent fastness to light, washing, and perspiration. They can be discharged white and are resistant to drycleaning. The dye works well with resins.

Remazol Yellow GCL . . . yields pure greenish-yellow shades of remarkable fastness to light and washing. You can apply it by any usual printing, padding, or exhaust methods. The color discharges to pure white.

Remazol Brilliant Red BBB . . . gives brilliant bluish-red shades on cellulosic or polyamide materials. Fastness to light and washing is good, and the color is easily discharged even in deep shades. Suggested for dyeing brilliant pink shades where you need good lightfastness. Carbic-Hoechst Corp. **(Write D-7 on Reader Service Card.)**

Reactive Dye

Cibacron Brown 4GR . . . produces pure, yellowish shades of brown on cellulosic fibers and is also useful for printing on wool, unions, and silk.

The color is very soluble, has excellent lightfastness, and is applicable by all conventional dyeing and printing methods used for reactive dyes. Print pastes made up with this dye are very stable. Colors produced have good lightfastness after resin finishing. Ciba Co., Inc. **(Write D-8 on Reader Service Card.)**

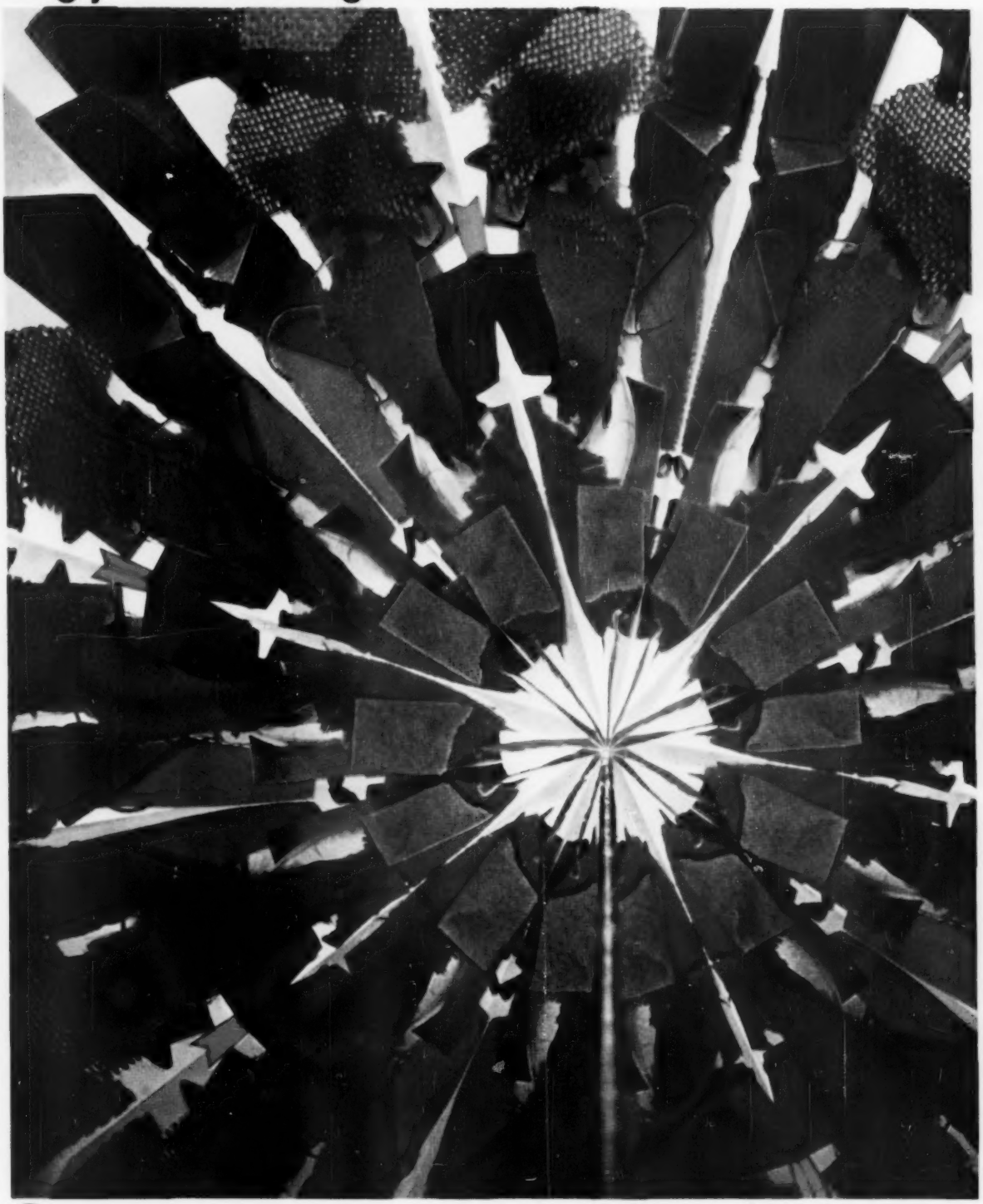
Improved Naphthols

Naphtol AS . . . is a series of Naphtol AS colors that have exceptionally good solubility. The AS variants, for quick identification, all include the letters LL in their designation as follows:

Naphtol AS-BOLL, Naphtol AS-CALL, Naphtol AS-ITRLL, Naphtol AS-LCLL, Naphtol AS-SWLL, Naphtol AS-KGLL, Naphtol AS-LBLL, Naphtol AS-LGLL, Naphtol AS-SGLL.

You make the solution by simply stirring into hot caustic solutions. You don't need protective colloids or highly sulfonated oils. Liquors have good stability even in hard water. LL grades foam very little, and any foam breaks down quickly. Carbic-Hoechst Corp. **(Write D-9 on Reader Service Card.)**

Geigy offers a brighter '62



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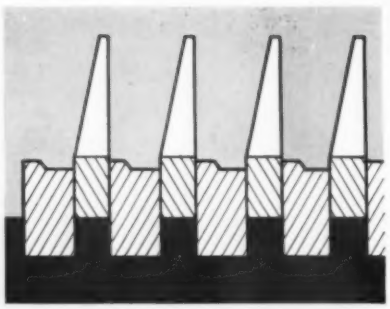

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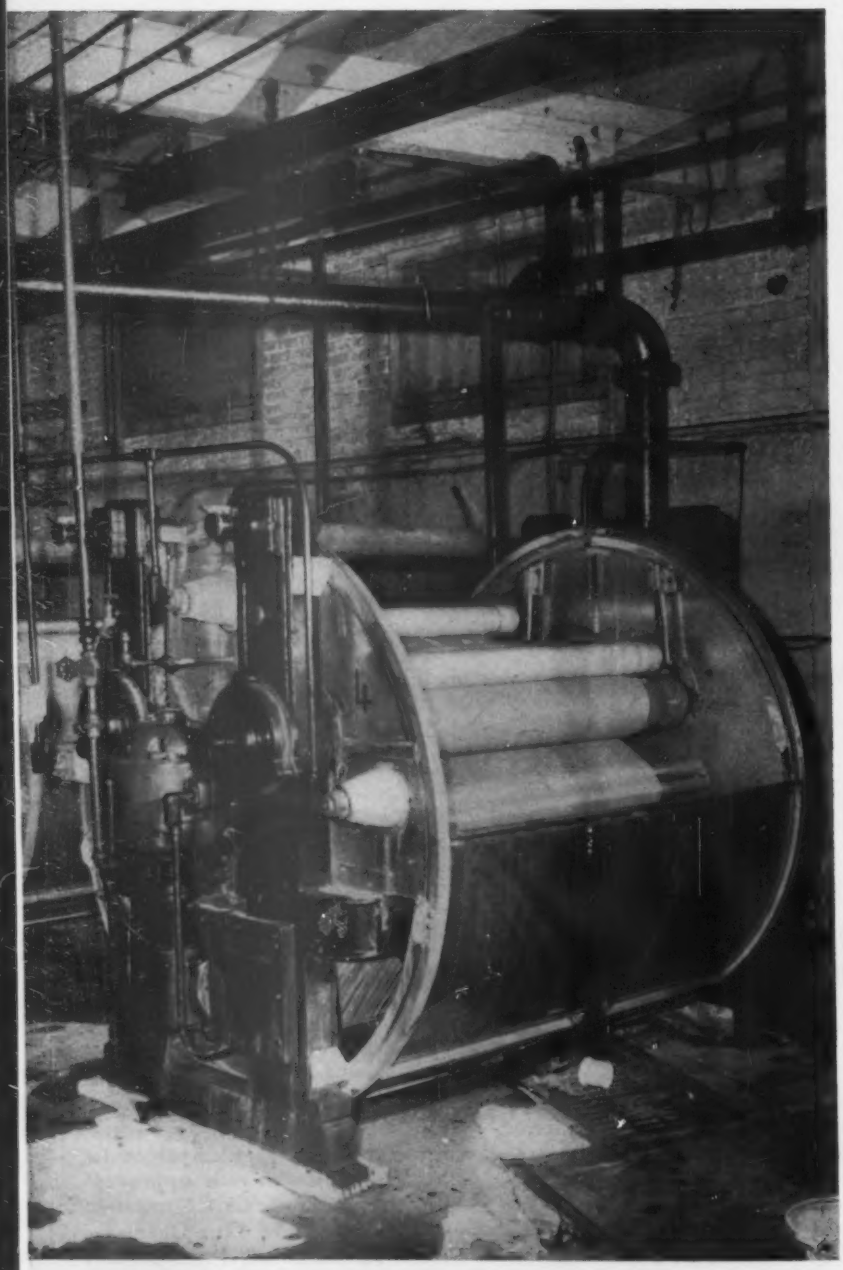
A TEXTILE WORLD UPDATE

What You Should Know About



COVERED JIGS, equipped with temperature controls and preferably of constant-speed type, are considered best for reduced-vat dyeing of material.

This installment of our "refresher" series outlines the principal procedures of batch and continuous processes based on pigment padding as well as reduced-vat dyeing methods.

PIGMENT padding is the most important vat dyeing system in use today. And it will highlight this month's installment of TEXTILE WORLD's vat dyeing series. You'll learn the pros and cons of dyeing by padding systems and by reduced vat dyeing methods. And you'll get pointers on how to get best results with the machines described in last month's installment (TEXTILE WORLD, November 1961, page 94).

PIGMENT PAD DYEING

Primary machine for applying vat dyes is the dyepad. It must be a rugged piece of machinery, capable of exact distribution of pressure from side to side.

Even with the best equipment the dyer is still troubled by shading from side-to-side, side-to-center, and back-to-face. The only reliable check on pad performance is the "sew-up" patch, made by sewing full-width strips of dyed cloth selvage to selvage, and each selvage to center. During a run, you have to

By the late O. W. CLARK
Dyes Department
American Cyanamid Co.
Bound Brook, N. J.

Vat Dyeing Today—Part 9

take such sew-up patches often to check the dyeing.

Early pad dyeing was done by application of reduced vat dyes. Today, for special purposes, vat-acid solutions or soluble vats are used. But the pigment-pad, with finely-divided pigments, prevails.

What you need—In the pigment-pad system, you pad the goods through a dispersion of vat dye in pigment form. Well-prepared cloth and an adequate padder are "musts." You'll need to coat every fiber evenly with the pigmented dye—a difficult task with hard-twisted yarns or poorly prepared goods.

Your goods should have an even moisture content at the time of padding. Some plants add a rewetting agent to goods being dried in preparation for pigment dyeing. Others put the cloth over dry cans or between hot plates to even out the moisture content just before the cloth enters the pad.

Overly dry goods will not wet out readily. Rewetting agents unevenly dispersed throughout the cross section of goods can give trouble.

If you use rewetting agents, pad the goods at high speed through a heavy pad with a small-volume pad box (see page 88). This way, there's less bleeding of the rewetting agent into the dye liquor. Too much rewetting agent in the dye can increase migration of color.

Preparing dispersions—Correct formulation and preparation are important in pigment-pad dyeing. Dilute dispersions may foam, aggregate, form scum, or build up on pad rolls. A good wetting agent helps avoid these troubles.

Pure soft water is probably as good a vehicle as any other for vat-dye dispersions. But for some purposes, you'll find various phosphates of sodium, sulfonated oils, and more complex wetting agents and detergents useful in small quantities. Nonionic detergents precipitate above 140 F., and the tiny particles of detergent can act as nuclei for aggregates of dye particles. This can cause specking.

Some dispersing agents based on naphthalene sulfonic acid-formaldehyde condensations are often included in vat-dye pastes and powders. Also lignin sulfonates are often used. These materials are useful additions to a dye bath. They restrain aggregation, may increase color value, and help keep pad rolls free of build-up of color.

You can add various electrolytes such as salt, sodium acetate, sodium bisulfite, or sodium sulfoxylate formaldehyde to vat-pigment dispersions to reduce migration of dye when drying padded cloth. Electrolytes are dangerous because they cause dye particles to aggregate.

You can use thickeners such as alginates, vegetable gums, and some synthetic substances to reduce dye migration. Thickeners also improve the union in dyeing cotton and viscose blends. You should prepare these colloidal materials carefully to avoid dye aggregation and color build-up on pad rolls.

Using emulsions—Oil-in-water emulsions greatly help in getting good vat dyeings. They give a good surface appearance and conceal imperfections. Emulsions also minimize migration. Here's how you prepare a typical emulsion:

Into a tank equipped with a shear-type mixer such as an Eppenbach, a turbo-mixer, or a Charlotte colloid mill, put the following:

417 pounds water (70 F.).
1 pound octyl alcohol.
Add:
12 pounds carboxymethyl cellulose (HV120).
Stir until dissolved, then add:
40 pounds sodium lignin sulfonate. Stir until dissolved, then add at the rate at which it emulsifies:
530 pounds mineral spirits (No. 1 type Varsol).

Stir until you get a smooth, stable emulsion. The temperature should not exceed 120 F., preferably not higher than 100 F.

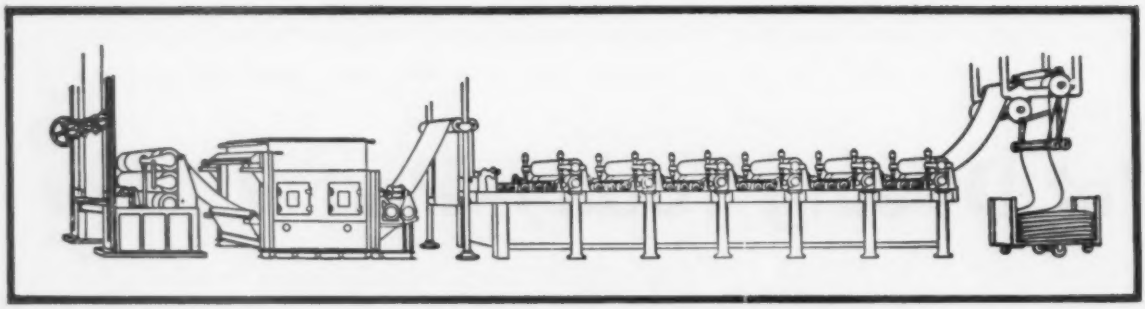
If you are going to use the stock emulsion within 24 hours, you can use a propeller-type high-speed mixer to prepare it. If desired, you can soak the carboxymethyl cellulose in water overnight.

A typical padding bath contains 10% by weight of this stock emulsion. With a propeller-type mixer in operation, add water at 80 to 100 F. to the padder tank. Then add the emulsion through a metal screen, without prior dilution. Add the dispersed dye and adjust liquor volume to the specific level.

In general, stability of a vat dye dispersion is also detrimentally affected by too high a temperature, by too vigorous agitation, and by too long a storage time. One authority states that the safest temperature is about 120 F. And temperatures above 140 F. can be quite harmful to the stability of a dispersion. Also, in general, he feels the maximum safe storage time is 2½ hours, although this may vary with local specific conditions. Furthermore, he warns that high-speed agitation promotes aggregation, besides being unnecessary. A slowly rotating agitator is enough to overcome any slight tendency toward settling.

Drying padded cloth—For good results, you need fast, even drying of the vat pigment in the cloth without migration.

You can predry on cans or through hot flue dryers. Many plants use infrared heat generated by gas or electricity to "freeze" the pigment in place. Infrared is fine if it is en-



PAD-STEAM RANGE can be used for reduced-pad vat dyeing, when you don't have intermediate drying facilities available. Most dyers use this method only for light shades—and pigment padding has replaced this method to a large extent.

VAT DYEING TODAY—PART 9 . . . *Begins on page 84*

tirely even in its heating effect—dangerous if it is not.

Keep flues scrupulously clean, or you'll have trouble from colored lint flying about. Advantage of cans: They're easily inspected.

To avoid two-sidedness in can drying, you must run at high speed —100 ypm. or more. You should preheat the goods in a small flue dryer mounted ahead of the cans. Some plants keep the first few cans at a reduced temperature to get a gradual warm-up of the fabric.

REDUCED-VAT PADDING

There are many objections to reduced-vat padding — limitation of shade depth, unsatisfactory surface appearance, poor stability of leuco compounds over a period of time, and need for careful selection of dyes with expert operators to apply them.

Method 1—When you must dye by reduced dye methods, put goods through at 100 to 200 ypm. in a 10- to 12-ton pad. Don't immerse the fabric in the dye box. The usual oxidation and soaping steps follow. You should confine the procedure to light shades.

Method 2—You can modify straight reduced-dye padding by taking padded goods to a jig and re-reducing them. You get better fastness, better color yield, and brighter shades than you would by using the reduced-dye method. But your costs are higher and production is lower.

The method is not used much today. The Williams unit usually supplants the older booster box in plants where the system is in use. Better control and less liquor volume (about 10 to 15% of conventional booster boxes) make the Williams unit preferable to the old booster box.

Method 3—Third variation on padding with reduced dyes: Put goods through a steamer placed immediately after the pad. The steamer must be big enough to permit a 10-sec. dwell at 220 F. This process improves the dyeing and is useful for light shades or where pigment dyeing might give specks (drawing).

Sometimes, you can run the goods through reduced dye in the first pad, then through a second reducing bath in a second pad, and then into the steamer. Next—rinse, oxidize, and soap the goods.

REDUCED JIG DYEING

Few operators process yardage by applying reduced vat colors in the jig. About all that're handled this way are small lots, extra heavy fabrics, or low-quality work. Reasons? Penetration is poor, labor costs are high, and surface defects don't cover well. There are many other small, but troublesome, operational details that make reduced-jig dyeing unpopular.

If you must dye vats by the reduced method on a jig, see to it that goods are even in width and well prepared, and that yardage per roll is not too great. About 1,000 yards of a lightweight fabric is plenty, or 600 to 700 yards of a medium-weight fabric.

Set the bath at the recommended temperature with the following:

¾ to 2 ounces caustic soda.

½ to ⅔ ounce per gallon of hydro.

$\frac{1}{16}$ to ¼ ounce per gallon of an anionic wetting agent.

Quantities vary with the dyes you use and size of roll to be dyed.

Heat the bath to the temperature suggested for the dye in use, and maintain it manually or through automatic controls.

Run the goods through this bath one end, then add:

¾ to 2 pounds hydro.

⅔ of the required dye in reduced form.

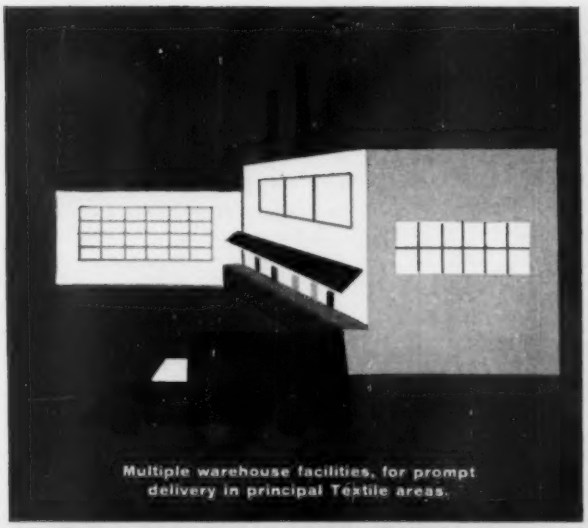
Run the goods one end. Then add the balance of the dye and run a second end. Run three to five ends more in the dye bath. Add about 1 pound of hydro for each end to keep the dye well reduced. The total amount of hydro shouldn't exceed the original amount of caustic. So in some cases you'll have to add both caustic and hydro.

A good operator can tell by observing the liquor how the bath is running. Indicator test papers are also helpful in determining the alkalinity of the bath.

More color—You can increase the color yield by adding common salt to the dyebath at each end after the first two ends. Add salt to slow-exhausting dyebaths at the start of the dyeing if the rolls are not too large. Covered jigs cut down chances of edge oxidation and save hydro (see photo, page 84).

Sample this initial dyeing and wash, oxidize, and soap the batch.

If you have to add dye, reduce it at the highest allowable reduction temperature for 5 minutes, then cool it to normal reduction temperature. Add half the new color to each of two ends, plus any necessary hydro and caustic. Then check the



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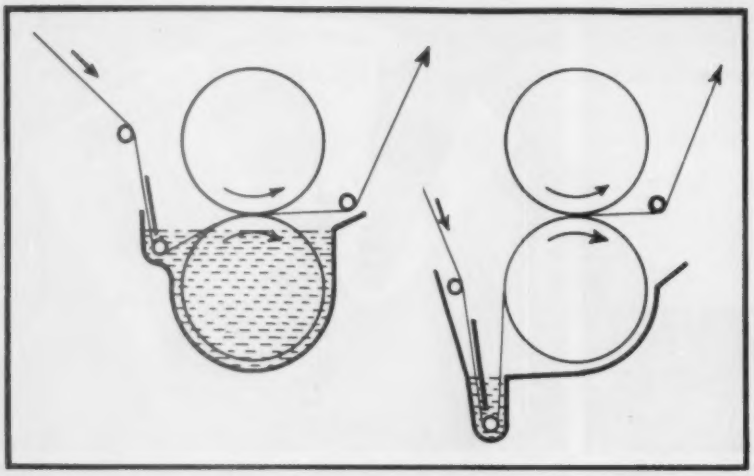


SCHEMATIC of typical low-volume pad boxes. Rapid turnover of liquor is their key value. This minimizes selective absorption, useful in soluble-vat dyeing.

VAT DYEING TODAY—PART 9 . . . *Begins on page 84*

goods again for shade. If they are a match, follow with washing, oxidation, and soaping.

Points to watch—Watch out in dyeing vat colors on jigs by the reduced method:

- Keep the goods moving, except when sampling them.
- Keep the rolls straight and true—otherwise you'll have dark and light areas.
- Be sure to keep the bath well reduced.
- If leuco stability is a problem, try adding sodium nitrate to the bath. Sometimes it helps.
- If oxidation is a problem, dextrose or sodium sulfide will retard it.

When to use pigments—You can minimize troubles inherent in the reduced-jig method by applying the vat dye in pigment form. To do this, run the goods for several ends at the boil in the dispersed vat pigment. Then add the reducing chemicals and proceed as you would in the reduced-jig method.

After thoroughly rinsing, follow with oxidation.

You can carry out a typical oxidation procedure for either method in a jig half full of water that contains the following:

2 quarts 130-vol. peroxide.
3 quarts 56% acetic acid.

Run one end at 160 F. Then add 1 quart peroxide and 1 quart acetic acid. Run two more ends, drain, and refill the jig with boiling water. Add 5 pounds of soda ash and 4 to 5 pounds of an anionic detergent. Run at the boil for 3 ends, rinse in fresh boiling water for 3 ends, then shell up in warm water.

A tip: Experienced dyers often find that raising the dyeing temperature above that usually recommended will give a better surface appearance. But your chemical costs may be higher at high temperatures, and you must pick dyes with good leuco stability. Here again additives such as sodium nitrite improve stability, and dextrose or sodium sulfide help prevent premature oxidation.

DYEING THE PAD-JIG WAY

For small lots in a variety of shades, the batch method of vat dyeing is still important. You get good fastness, penetration, and overall good appearance on well-prepared fabric by this system.

Here's the routine:

Pad on the dispersed color and move the wet roll onto a jig. On the jig reduce the color in four ends in a bath that carries the necessary amount of caustic and hydro, plus salt if needed. (Occasionally, you may want to use trisodium phosphate instead of caustic soda.) After reducing the dye, drain the bath, rinse, oxidize, and soap.

If shade is within 20% of a match, you can (before oxidizing) add correcting color over two ends. If you're way off, better complete the dyeing, dry the goods, and repad with pigment. Too much color can accent surface defects.

A way to cut costs when you don't need first-class dyeing: Pad on only about one-fourth the needed dye. Then add the balance in the jig under reducing conditions. The result is somewhat better than you would get with straight jig dyeing. And the cost is a little below the pad-jig method. Why? Because dye added in the jig penetrates poorly and builds up on the surface.

HANDLING SOLUBLE VATS

If you must, you can dye soluble vat dyes on jigs. Choose the more substantive and easy-developing types for jig work.

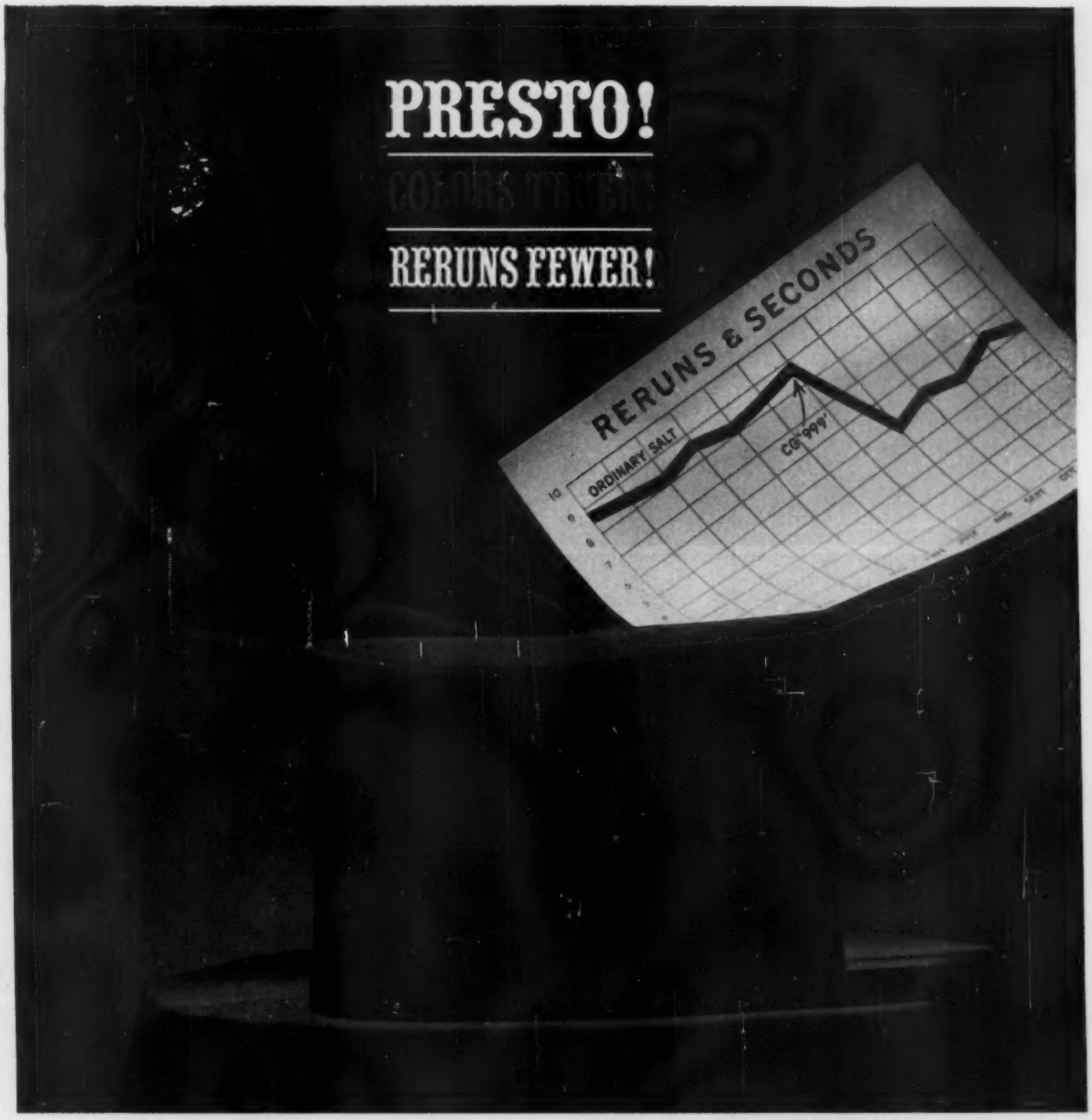
Pick a jig located away from direct sunlight and acid fumes. Add $\frac{1}{16}$ to $\frac{1}{8}$ ounce per gallon of soda ash, plus the same amount of hydro to the bath, to increase bath stability. Overdoing these chemicals may interfere with subsequent development of the shade.

Jigs used for this process should be made of materials that will be able to stand the corrosive action of the sulfuric acid-sodium nitrite developing bath. If you use soluble vats infrequently, ordinary jigs may do the job for you. That is, if you use the easy-developing dyes and keep the developing temperature to about 80 F.

A few soluble vat dyes are sensitive to over oxidation. And if you have to use them, it is better to dye in one jig and develop in two following jigs. The first of these jigs carries the sodium nitrite-sulfuric acid solution at 140 to 160 F. through which you run the goods one end. Then move the goods to the second jig, which contains cold running water. The goods are shelled up on the far beam to maintain constant speed.

After development, neutralize the goods in a bath containing about 3 pounds of soda ash per 100 gallons, or enough to neutralize the residual acid.

Final step is to soap the goods four ends at the boil with soap and soda ash to secure maximum fastness, especially to light.



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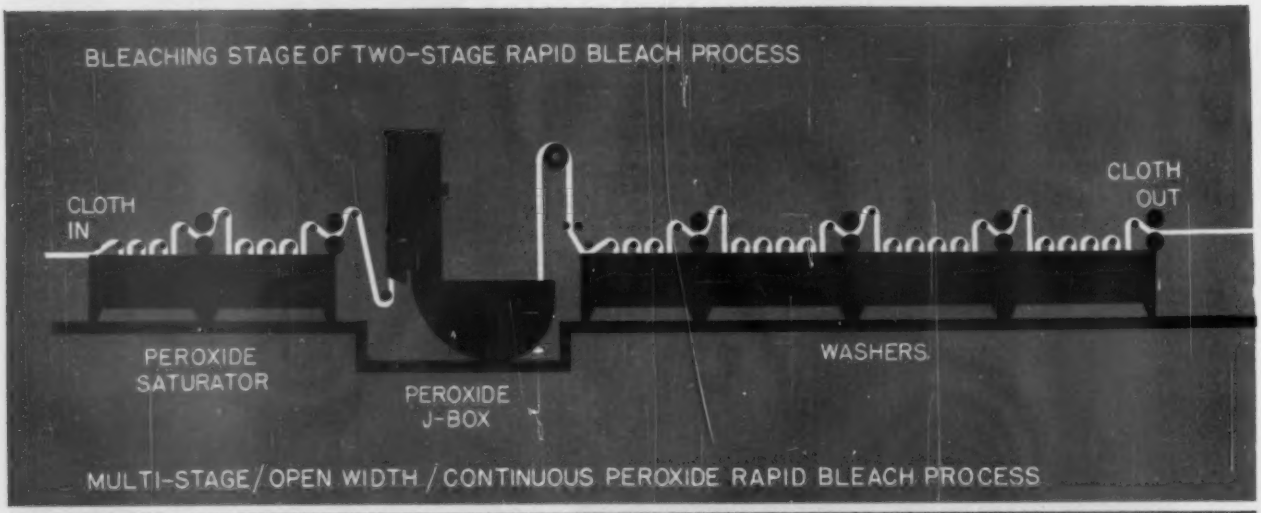

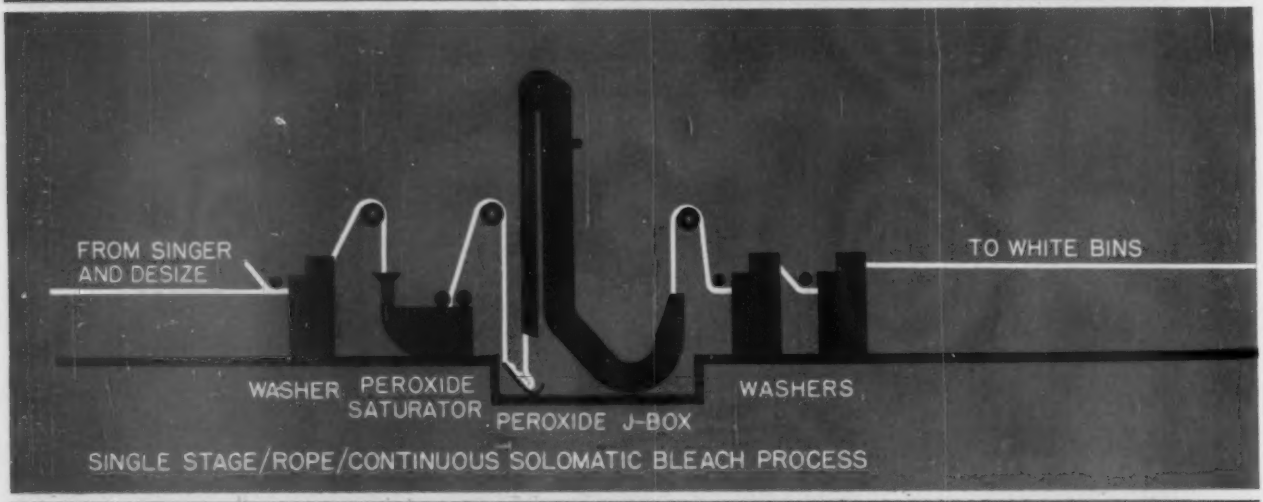

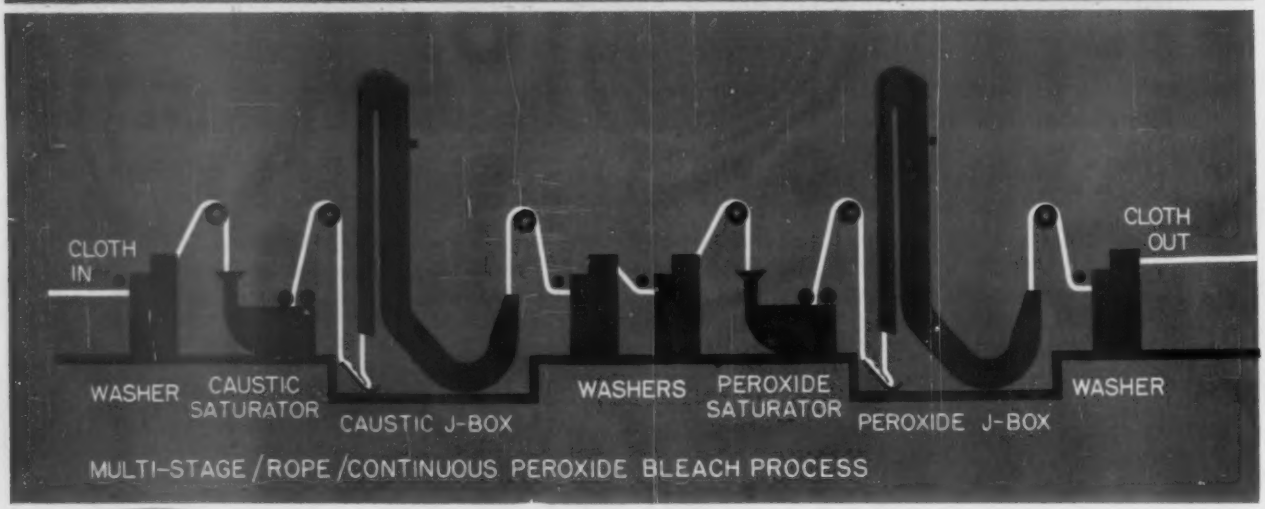

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Wash-Wear Keeps 'Em Talking

Wash-and-wear finishes: why they work, where they are weak, and what to do about their shortcomings. Those are the highlights of papers presented at this year's Chemical Finishing Conference in Washington.

IS THERE anything new left to talk about in wash-and-wear finishes? That question came into focus at last month's Chemical Finishing Conference in Washington—sponsored (as always) by the National Cotton Council and attended by over 375 chemists, scientists, and finishing-plant technicians.

"Yes," answer many manufacturers and finishing plants ready to report test results of different types of wash-and-wear finishes.

"No," say other conferees, who feel the meeting was "mapping out a pretty well explored country."

These points of view plus new data on wash-and-wear were among highlights of the conference.

Another highlight: Announcement of all-cotton stretch fabrics that retain their bulky and elastic properties through normal laundering procedures. This development of Southern Regional Research Laboratory (SRRL) is brought about by a combination mechanical-chemical treatment described more fully below (see *Now—Stretch and Bulk for Your Cotton Products* page 96).

Here's a quick look at the salient points of some of the papers presented at the conference:

Key to Crease-Resistant Cotton: Few Crosslinks?

Work is rapidly moving ahead to find data to support the theory that crease-resistance in resin-finished goods is a result of relatively few crosslinks of the reactant and the cellulose. In current research, workers are developing a way to clock the reaction rate of cellulose reactants with cellulose.

In this theory, a good part of the resin or reactant is not taken up in the formation of covalent crosslinks. It is employed in reducing the hydrogen-bond interaction between cellulose molecules by intramolecular or intrachain reaction. This latter effect is in part responsible for the loss of strength that always accompanies crease-resistant finishes in resin-treated goods.

Thinking behind the theory is this: Cotton is made up of accessible and inacessible areas, as regards reagents that modify it. The strength of cotton is controlled by the forces acting between the molecules of the accessible regions. These forces include van der Waals forces and forces due to hydrogen bonding. The latter forces are considered more important. The researchers believe this strong hydrogen bond is responsible for both the inherent strength of cotton and its lack of rubberiness.

Now if you break these hydrogen bonds and replace them with weaker bonds, the characteristic weakening of the resin-treated fiber will result. This loss of strength is caused by a larger proportion of intramolecular bridges present that interfere with the normal hydrogen-bond crosslinking of cellulose molecules. Strength loss bears out the theory that only relatively few covalent crosslinks are formed as a result of resin-treating.

The theory is well supported by data on tensile-strength loss, which is directly proportional to the improvement in crease resistance developed in the test fabrics under varying conditions of concentration, curing time, curing temperature, and catalytic systems.

Conclusion: Some tensile strength loss is a necessary part of wrinkle-recovery improvement. Tensile-strength data indicate the importance of hydrogen-bond interaction on cotton properties. They also indicate that the effect of a reactant on cellulose depends as much on alteration of the hydrogen-bond interaction between molecules as on the formation of covalent crosslinks. *S. J. O'Brien and W. J. van Loo Jr., American Cyanamid Co.*

Nonvolatile Solvents Alter Resin Effects on Cotton

Extensive experimentation with nonvolatile solvents may point the way to processing techniques that will open new fields in cotton finishing. Here's the premise:

If you include a nonvolatile solvent such as polyethylene glycol, methoxytriglycol, or the monomethyl ether of polyethylene glycol in the resin-treated bath, you can expect some variations in the total effect of the resin on the cotton. The theory behind this extensive experimental work on the solvents is that curing resin-treated fabrics in a swollen condition (maintained by solvents) may give you this new processing technique.

So far, findings indicate that the assumption is true in some respects. But at this stage, curing resin-treated goods in a swollen condition

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Here are some interesting points discovered:

- Dimethylol ethylene urea (DMEU) resins applied with solvents give better wet recovery from creasing than dry.
- Mercerized goods respond better than unmercerized goods—especially if they aren't dried between mercerizing and resin treatment.
- You get better moisture absorption and imbibition on goods treated with the resin-solvent mix than you do with straight resins.

Because the solvents make the interior of the fiber more accessible, both water-soluble and water-insoluble compounds in emulsified form might be introduced into the fiber to produce wanted improvements in performance. *Emery I. Valko and Kunjviharl M. Limdi, Lowell Technological Institute.*

Overstretching Improves Filling Strength

You can increase the percentage of retained breaking strength on resin-finished fabrics materially if you stretch them before and as you apply the finish. In a series of 36 tests on mercerized and unmercerized broadcloth and print cloth, Harris Research Laboratories finds that putting a permanent stretch on the filling of a print cloth of 9.8% can give you a strength retention of 60%, compared to 48% for unstretched resin-treated goods. If the cloth is mercerized, even higher strength retention is possible.

The men ran tests by prestretching the goods before resin treatment, then stretching them during resin treatment. They used three levels of stretch—enough to dry goods without wrinkling, a tension just below the breaking point, and an intermediate tension. They used these tensions both in prestretching and in resin treating and drying.

Findings: Maximum tension in both pretreatment and resin finish produces the greatest increases in strength retention fillingwise. Mercerization further improves this result, although wash-wear characteristics are not so pronounced on mercerized goods. Warp strength does not suffer, except in proportion to the reduction of warp threads per inch as a result of stretching. Elongation of the stretched yarns is less than for unstretched yarns. But abrasion resistance is higher. Wash-wear index and wrinkle recovery are not affected by the stretching. *S. P. Hersh, Union Carbide Chemicals Co., and A. M. Sookne and J. H. Margeson, Harris Research Laboratories.*

Way Found to Control APO Finish Yellowing

Researchers at Dow Chemical Co. have discovered the causes of yellowing of APO finishes—and a way to avoid the trouble.

The problem was this: Tris (1-aziridinyl) phosphine oxide (APO) is an excellent resin for crease-resistant finishes on cotton. But it has one drawback—it causes yellowing if the fabric is bleached with chlorine and scorched by AATCC Tentative Test Method 92 (1958).

Dow researchers looked long and hard for the reason. They thoroughly checked the APO, bleaching solutions, pH of bleach treatment, cure temperature, and other factors that might cause yellowing.

They finally concluded: The yellow color produced by hypochlorite bleaching and scorching on APO-treated fabrics is caused by:

1. Primary resins formed from hydrolysis of phosphorous-nitrogen bonds, either during the cure or during scorching.
2. Alcohol groups formed from water-opening aziridine rings on APO, oxidized by hypochlorite to aldehydes.
3. The Schiff base, formed between the amine and the aldehyde, decomposed on scorching.

How to avoid this trouble? Here's the recommendation:

1. Use fresh APO baths, made from high-purity APO.
2. Keep the treating bath at a low temperature—around 0 to 25 C.
3. Use nonaqueous bath for treating, such as alcohol. Then if the aziridine rings are opened, an ether rather than an alcohol is produced as a result of the treatment.
4. Use sodium perborate. It produces practically no color if it is used as a bleaching agent. *R. B. LeBlanc and A. P. Ingram Jr., Dow Chemical Co.*

What Effect Does Fabric Construction Have on W&W?

Fabric design or construction has little effect on wash-and-wear appearance or performance. But fiber strength, fabric weight, and design do affect breaking and tear strengths. And it is obvious that stronger base fabrics are needed to counteract the effect of resins and reactants on the wearing qualities of treated goods.

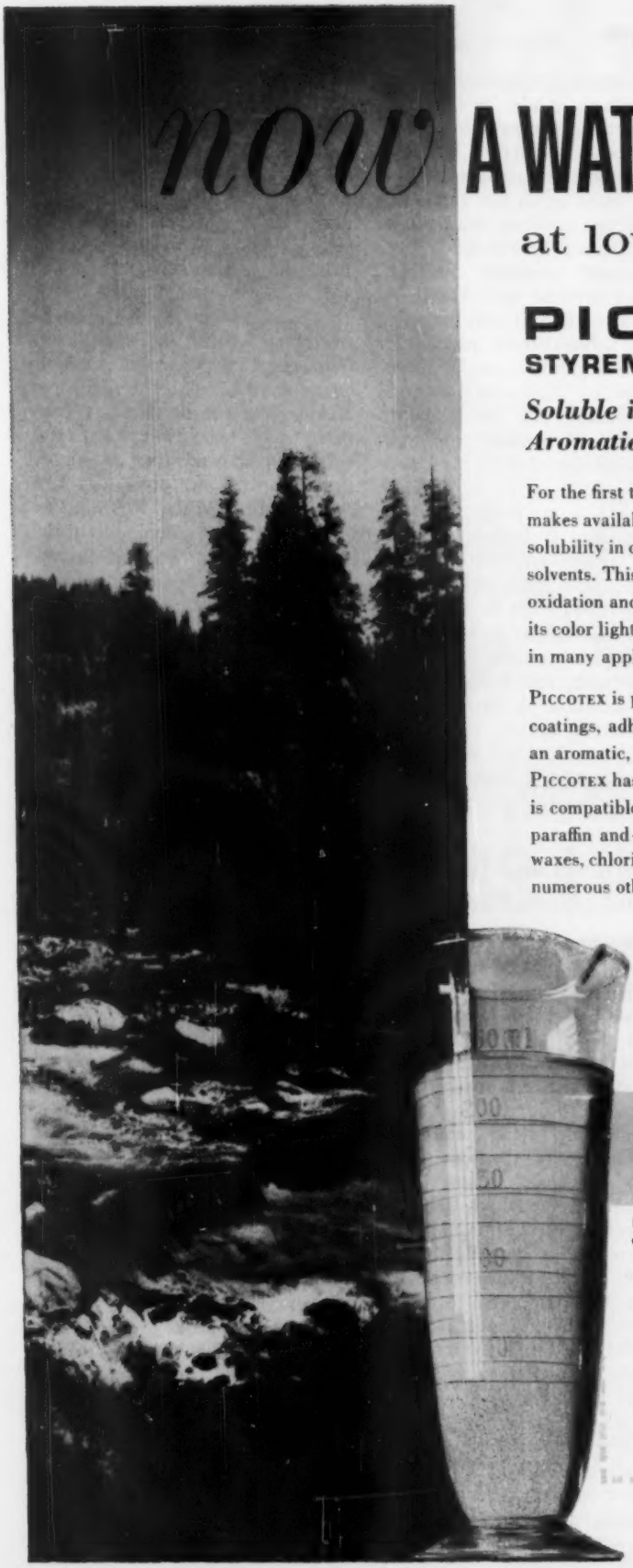
Findings include the fact that wash-and-wear finishes affect light, open-weave fabrics more than closely woven materials. Fabrics made from coarser yarns perform better than similar goods made from finer yarns.

More significant than fabric constructions are the interactions between fabric construction and resin-treatment variables. There's good reason to believe that not only the resin, but the softener, the application method, the catalyst, and the cure conditions need trial and error experimentation to assure optimum results on any given fabric construction. *John F. Krasny, Arnold M. Sookne, Harris Research Laboratories, and Paul B. Stam, J. P. Stevens & Co.*

How Humidity Affects Crease Recovery

The effect of humidity on untreated or crosslinked cotton and rayon fabrics is to some extent proportional to the differences in amorphous areas of each of these forms of cellulose.

For example, crease recovery of untreated rayon in air greatly depends on relative humidity. But this isn't true for cotton. At high relative humidities, recovery of crosslinked rayon or cotton passes through a minimum point. This phenomenon is a result of the plasticizing effect of the absorbed water, which induces a glass transition



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period in the fiber and produces a minimum in fiber resiliency.

At 0% r. h., rayon shows the previously unknown combination of high crease recovery and high abrasion resistance.

The change in fabric crease recovery correlates well with the variation in fiber resiliency as water content is varied in chemically treated rayon. This finding lends support to the view that crease recovery strongly depends on fiber resiliency. But this is not the only factor in good crease recovery (as shown by the fact that untreated rayon with a high water content has poor crease recovery).

Dry-state crosslinking increases crease recovery in both glassy and rubbery states—chiefly in the former. Dry crosslinking treatments generally reduce water absorption in cotton.

Wet-state crosslinking increases crease recovery in the rubbery state more than dry-state crosslinking. And it has little effect on the glassy state. Wet-state crosslinking increases water absorption of a fabric but decreases the water content at the crease-resistance minimum, and shifts the minimum to a lower relative humidity.

In general, absorption of water up to the transition point (glassy to rubbery) drastically decreases instantaneous crease recovery and slightly increases time-dependent crease recovery. Further absorption of water reverses these trends. The instantaneous crease recovery represents the major portion of the total crease recovery after 5 minutes for treated cotton and rayon fabrics at the tested levels of relative humidity. *Robert A. Gill, Rohm & Haas.*

Electrons Help in Hydrolysis of Resins

Whether substituent groups commonly found in amido-methylol compounds are electron-attracting or electron-displacing has important bearing on the behavior of these resins toward acid hydrolysis. Hydrolysis leads to loss of wash-and-wear properties and contributes indirectly to chlorine retention. Analysis of results obtained from the acid hydrolysis of a number of reaction products made by reacting amido-methylol compounds on cotton fabrics shows that if the substituent groups are attached to the carbonyl atom or to the amido-nitrogen, there's a strong and definite influence on acid hydrolysis.

Of several common finishes, dimethylol ethylene urea (DMEU) is most susceptible to acid hydrolysis, urea formaldehyde resins are next in susceptibility, and triazone derivatives are somewhat less susceptible than the other two. Melamine-based finishes are more durable than any of the others. But melamines such as N N′ N″-trimethylmelamine are more easily removed by acid hydrolysis than is methylol melamine.

The electron-displacement effects on acid hydrolysis can be explained through a mechanism in which initial electrophilic attach is at the ethereal oxygen, and fission of the link with cellulose is through cerbonium atom formation. *Wilson A. Reeves, Sidney L. Vail, and J. G. Frick Jr., Southern Regional Research Laboratories.*

Now—Stretch and Bulk For Your Cotton Products

Here are four ways to produce cotton products that have durable stretch and bulk characteristics:

1. Make high-twist plied yarns and treat them with dimethylol ethylene urea resins. You'll get the desired effects in fabrics made from these yarns. Procedure: Twist the yarns single, ply them, scour to aid in resin penetration, then treat with resin and cure. Then wash and dry the yarn and back-twist it beyond neutral ply twist.

When the yarn is relaxed, it tries to return to the highly twisted position in which it was cured, forming small helical coils. About 3½ to 4% DMEU add-on is enough to give you the wanted effect.

Textured cotton yarns have been produced this way that have more than 90% recovery after having been stretched 200 to 300% of their relaxed strength. Such yarns may appear to have lost their stretch properties when kept in extended position (such as bobbins) for a considerable time. But they will recover when relaxed, or spring back immediately if wetted.

Fabrics with high-stretch properties have been woven from textured filling yarns and untreated warp yarns. These have about 30% shrinkage. Performance of fabrics closely follows that of yarns.

2. Use resins to give durable stretch to knitted fabrics, as has been done at Clemson College. Again DMEU was the principal resin used to get the effects. Triazones gave best elongation, and melamines showed greatest energy to uncrimp. Card sliver was also treated with DMEU, followed by drying, drawing, spinning, curing, and back-twisting. Some sliver was cured in roving form, and varying degrees of twist were employed. Alternate S and Z twist yarns produced better-balanced fabrics.

Some samples were mercerized without tension. All had improved stretch properties over conventional knitted fabrics.

Slack mercerization processes for stretch properties only in the filling have yielded good results. Samples elongated 10% acquire a permanent set of about 10%. For 20% elongation, the permanent set is about 20%. Crosslinking reduces permanent set to less than half that of untreated material. To get stretch in the warp is more difficult, but the problem is being investigated with some promising results.

3. Break the hydrogen bonds of the cellulose, thus produce stretch fabrics. For breaking these bonds you can use ethylamine, sodium hydroxide of mercerizing strength, lithium bromide, lithium chloride, or calcium thiocyanate.

4. Make cotton thermoplastic. This way, texturizing is possible. Examples are treatment of cotton to form benzyl ethers or to get phenyl isocyanate derivative. The treatments are valuable in making permanent pleats. By crimping such yarns by known processes for man-made fibers, you can achieve good stretch and bulk properties. Knitted fabrics made from chemically modified yarns have better dimensional stability. *C. H. Fisher, Southern Regional Research Laboratory.*

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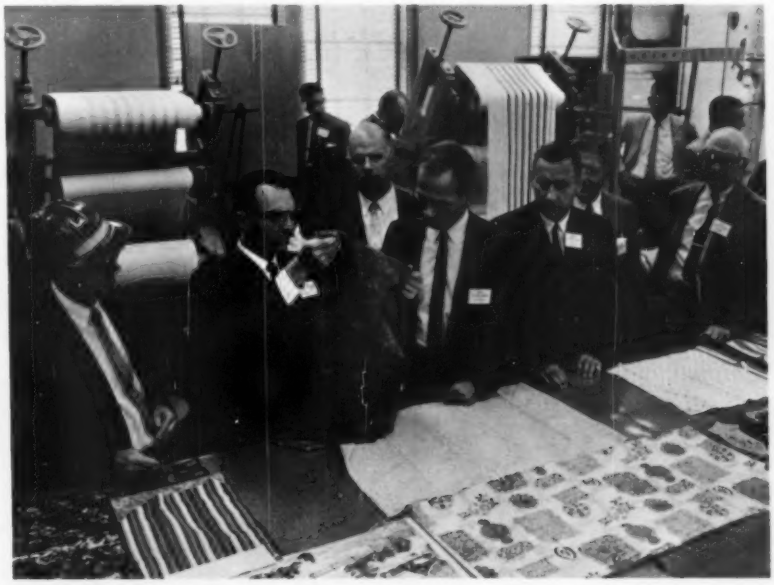
250 TEXTILE EXPERTS ATTEND "OPEN HOUSE" AT MODERNIZED DU PONT TECHNICAL LAB

DEEPWATER POINT, N. J.—After two years and 1.5 million dollars of renovation effort, the Technical Laboratory of Du Pont's Dyes and Chemicals Division was recently thrown open to a group of 250 textile industry representatives attending a two-day technical conference (story next page) at the company's headquarters in nearby Wilmington, Delaware.

The remodeled, forty-one-year-old technical sales service and development laboratory is a new laboratory on the same site. All that remains of the old building are the walls, the interior having been rebuilt entirely and re-equipped. The renovation provides the most modern laboratory facilities for application research on dyes.

The decision to renovate the existing three-story building, located within the company's Chambers Works here, was made because of the desirability of keeping the laboratory physically within the plant. Here it is in close contact with the nearby research facilities of the Jackson Laboratory and the technical and engineering services of the plant's production division.

The renovation was carried out step by step to minimize interruption of work on current development and sales service projects. This was possible because the laboratory is divided into separate, self-contained units. First to be completed was a new textile dyes laboratory. This was followed by renovation of the leather laboratory, the pigments and miscellaneous dyes laboratory, the laboratory specializing in textile and non-textile chemicals and finishing agents, quality control laboratory, and finally the realignment of administrative offices together with a modern conference room.

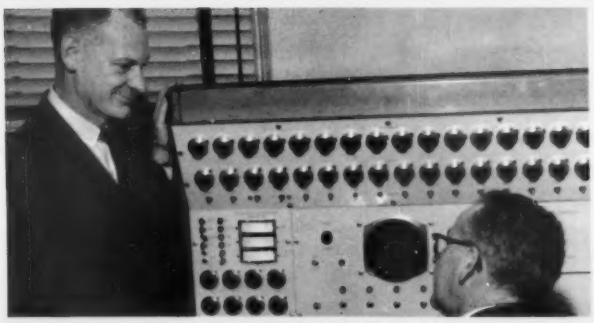


Representatives of the textile industry inspect fabric samples at Du Pont's newly equipped Technical Laboratory, now completely rebuilt after 41 years of service.

In addition to the remodeling and rearranging of space for more efficient use, the newest and most advanced laboratory equipment has been installed in each section. Among the more unusual pieces are a tristimulus differential colorimeter and a colorant mixture computer, both used in the scientific measurement of colors. Another new piece of equipment is a xenon textile dye tester for accelerated light fading tests, to supplement the standard "Fade-Ometer." All installations have been designed to insure maximum safety in working conditions, a policy which has enabled laboratory personnel to work more than nine million man-hours over a period of 18 years without a time-losing injury.

Continued

news from Du Pont



NEW DIRECTOR MEETS NEW "COMIC"

The Comic (verbal shorthand for Colorant Mixture Computer) is an electronic whiz that tells you what dyes to mix to match a desired shade. Here it's being given a run-through for Robert F. Stevens, newly appointed director of Du Pont's Technical Laboratory, by Joe Neary of the instrument group. The Comic, already widely used by textile mills, is being evaluated by Du Pont for possible use in improving service to customers by speeding the shade matching process.

TECHNICAL CONFERENCE REVEALS "WHAT'S NEW" IN SYNTHETIC FIBER DYEING AND FINISHING

This Du Pont quartet on the auditorium stage was only one of many that addressed textile experts at the Technical Conference. In photo, left to right: C. Z. Keresztes, J. S. Thackrah, H. P. Landerl, B. F. Faris. "Dyeing of 'Orlon'®" was subject of panel.

Nearly 250 representatives and editors from the textile industry recently attended a two-day technical conference as the guests of Du Pont in Wilmington. This was the fourth meeting of its kind during the last 10 years, all sponsored by the Du Pont Organic Chemicals and Textile Fibers Departments. They serve to bring customers up to date on the newest developments from Du Pont laboratories in the area of synthetic fiber dyeing and finishing.

Charles H. Rutledge, Textile Fibers, delivered opening remarks, followed by "Why New Fibers?" by Richard W. Trapnell, director of Textile Fibers Products Division; and "Color Is the Key," by William A. Bours, director of sales of Organic Chemicals Dyes and Chemicals Division.

Other topics: "Trends in Marketing of 'Lycra'® Spandex Fiber," by D. M. Colyer; "'Dacron'® of the Future," by R. J. Thomas; and "Dyeing Du Pont 501 Nylon," by L. Aquadro.

Field trips involved firsthand inspections of the Textile Research Laboratory and the newly remodeled Dyes and Chemicals Technical Laboratory.

news from Du Pont

Continued

Assistance in design of new equipment has been provided by Du Pont's Engineering Research Laboratory. Technical Laboratory personnel are also able to make use of advanced and specialized equipment available at the Chambers Works, as well as the technical services of other Du Pont groups engaged in related activities, such as the Textile Research Laboratory and Finishes Division.

The Technical Laboratory has a staff of approximately 220, including about 80 who are technical experts in specialized fields of dyes and chemicals applications. Out of their work have come a number of new and improved processes, including the Pad-Steam continuous dyeing process, "Unifog" spray, "Thermosol," and Sponge Core dyeing processes.

Besides research and sales service activities involving work on customers' problems, the laboratory maintains quality control over the plant's dyes and chemicals production, produces all the division's technical literature, and serves as a training center for sales and technical personnel of both the Dyes and Chemicals Division and its customers. Laboratory representatives in an average year also make about 700 trade calls and demonstrations in customer plants.

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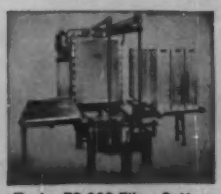

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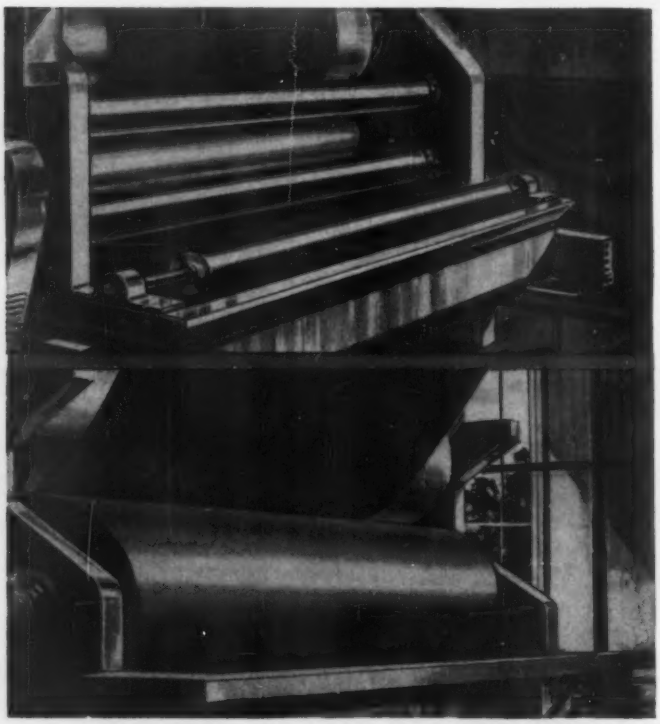

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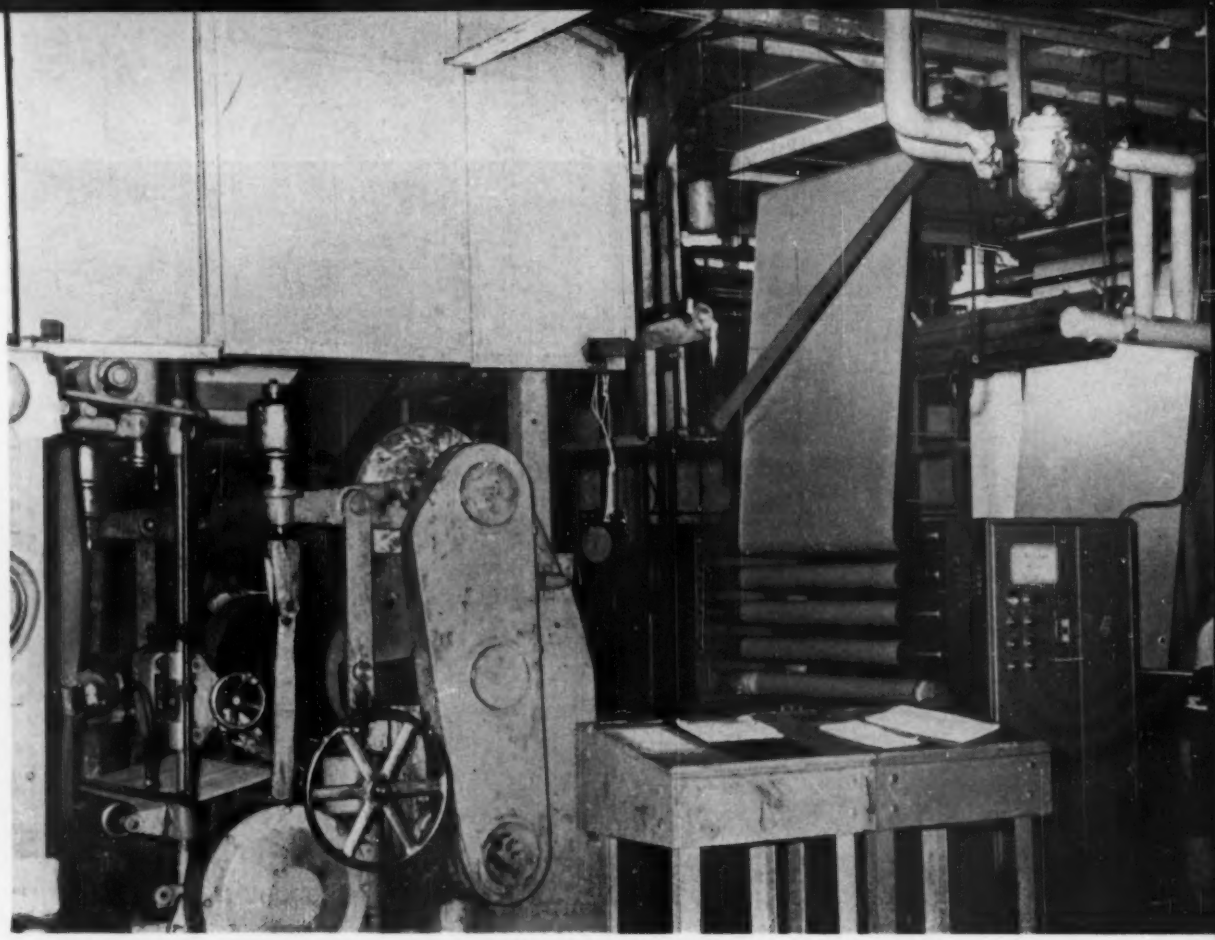

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Prestwick is a good example of what research and cooperative effort can do to produce merchandise that will sell faster.

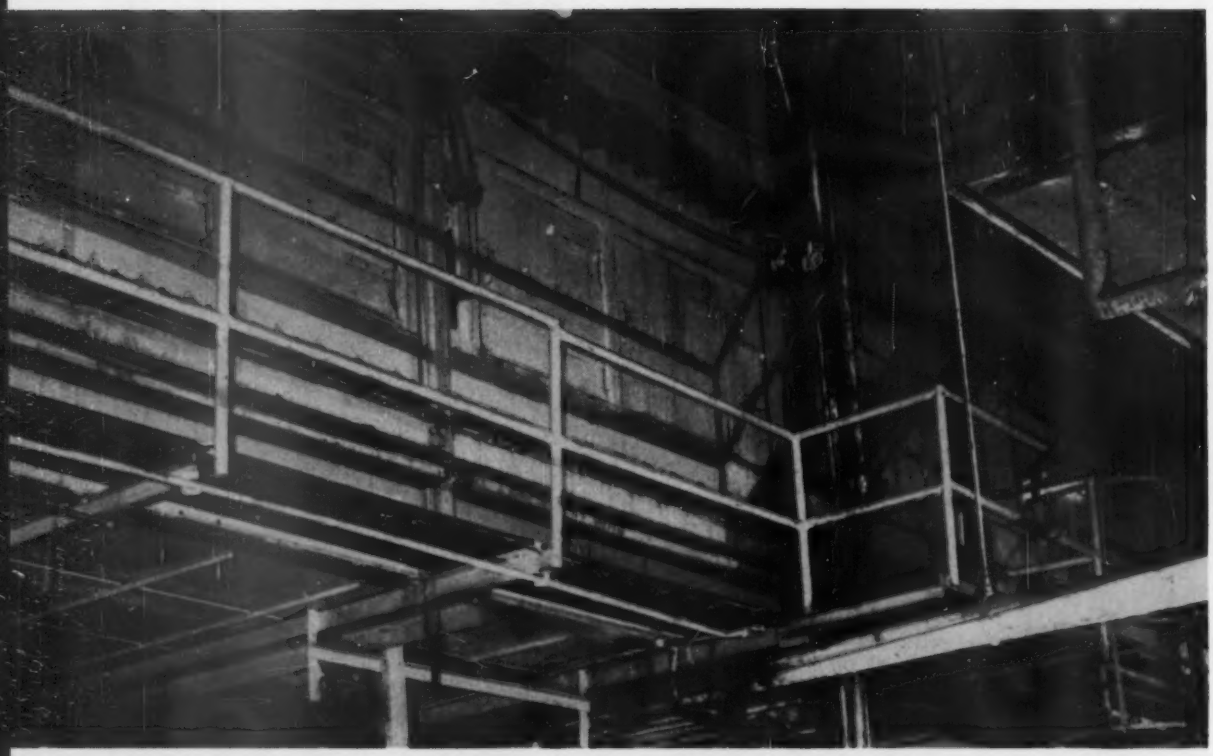
TAKE a good idea. Then work on it for a year or so to adapt it to your business. That's what Pepperell Mfg. Co. and Courtaulds (Ala.) have done. Result: Prestwick, a new finish for cotton fabrics.

Prestwick is a formaldehyde-based process. Though it works well on rayon, formaldehyde severely cuts tear strength on cotton. But the good points of formaldehyde-based finishes present a challenge to textile chemists. The chemical is not expensive. And it provides durable finishes with good crease-resistant properties that are not sensitive to chlorine.

The research staffs of Pepperell and Courtaulds went to work on the strength-loss problem of the formaldehyde-cotton reaction. How they have got it within reasonable limits isn't generally known, but a good guess is that controlled catalysis has a good deal to do with the successful results.

Neither Pepperell nor Courtaulds will confirm this guess. But it comes on good authority that magnesium chloride is the catalyst. The only other bath additives are softeners and lubricants. Curing temperature is somewhat higher than with dimethylol ethylene urea resins (350 F. or higher).

. . . *Turn the page*



HUGE curing oven is gas-fired, exposes goods for 1½ minutes at 320 to 350 F. to develop the new cotton finish.

A NEW COTTON FINISH . . . *Begins on page* 109

Pepperell uses Prestwick almost entirely on sportswear fabrics. A good percentage of these goods runs 1.25 to 2.75 yards per pound. Few require added weight or a built-up hand that usually comes when you use thermosetting resins to get wash-and-wear effects.

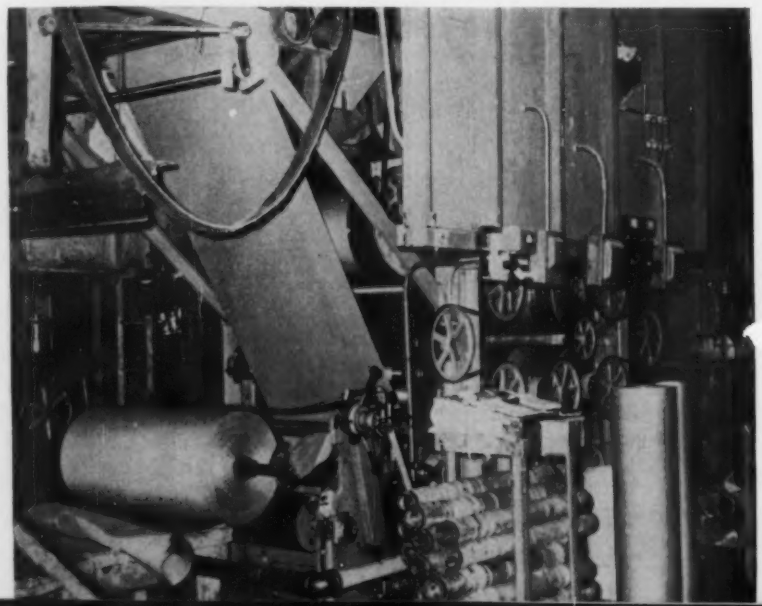
PROCESSING IS SIMPLE

Pepperell won't reveal exact formulations, but will reveal more facts about processes (photos). Goods are padded in a three-roll pad, put through a predryer, a tenter, a curing unit, and an open-width washer in one run. It's a one-shot process —no pretreatment is necessary. The fabric is processed at the bleached or dyed state. There is no more handling of goods than there is in plain pad-tenter finishing methods.

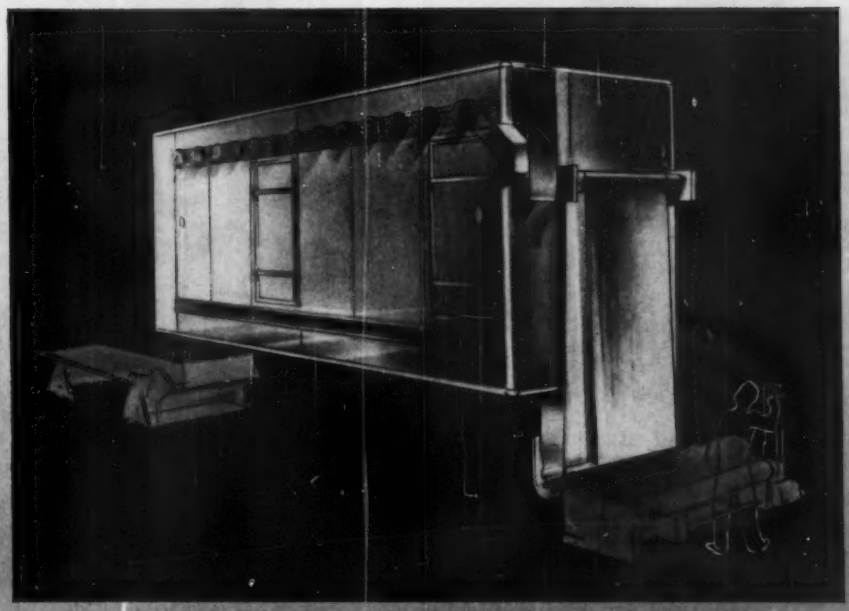
Most of the Prestwick production gets one more finishing touch. The fabric is put through a compressive shrinking range and is marketed under the "Sanforized Plus" label. That means it meets Cluett Peabody's new standards for wash-and-wear finishes.

Talking with Burt G. Hill, manager of the finishing plant, you find that not only is Prestwick well accepted by Pepperell's own customers for its fabrics, but a lot of the commission work done at the plant is being requested in the Prestwick finish.

END of range includes air-operated continuous contact batcher, four cooling cans, and 30 high-pressure drying cans. Open-width washing precedes the drying operation.



THIS IS **"NATIONAL"...**



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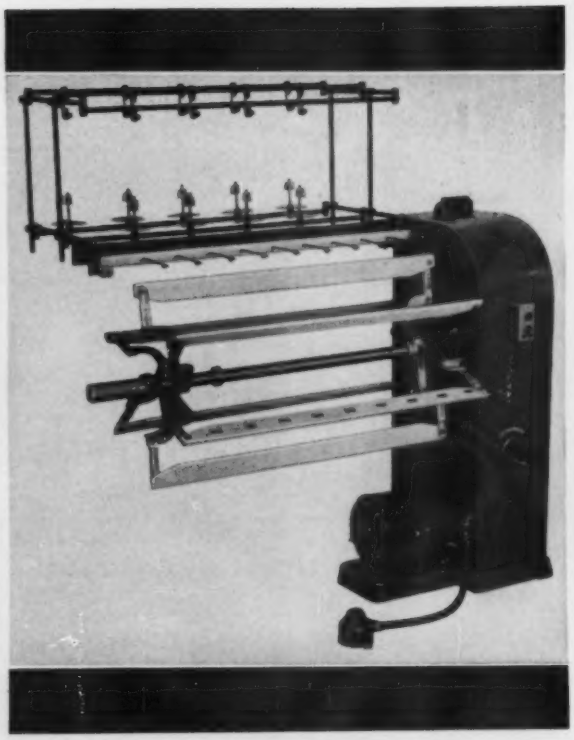

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Variable speed control	Adjustable yarn traverse
Adjustable yarn creels	Free end reels for quick doffing

The Fidelity Skein Reeler is job-proven in mills throughout the world. Small, compact reels permit operator to attend two or more machines. While operator is removing finished skeins and starting new ends on first machine, second machine is winding. There is no lost time—no waste motion. Reelers can be furnished with various types of supply stands.

For more information, write for brochure describing different laboratory and production models.

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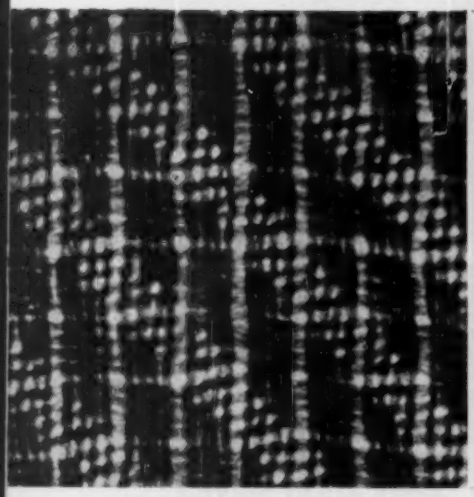
ADV. NO. 251

Independent research suggests

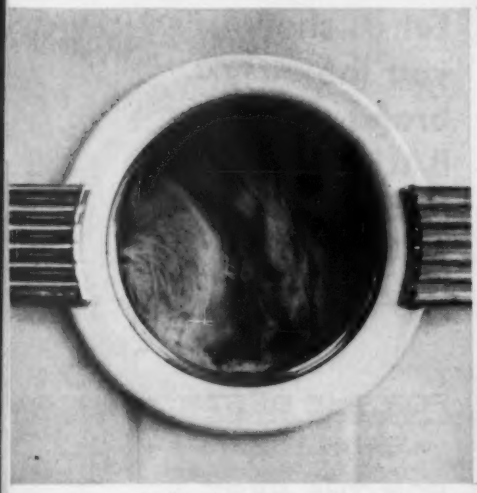
New ways A-C Polyethylene can help you



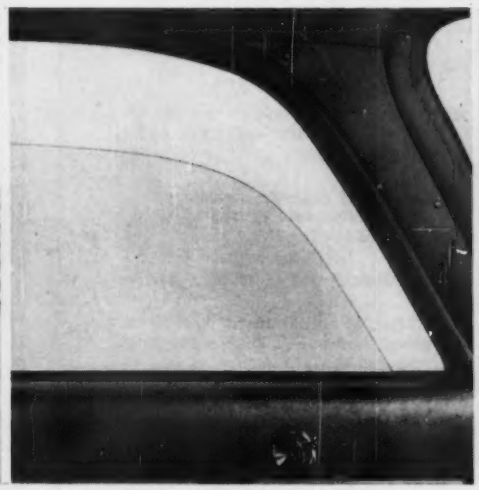
In warp sizes—to reduce friction and increase gliding of yarn on yarn.

In dry cleaner's soap – to increase tear strength of dry-cleaned textiles.

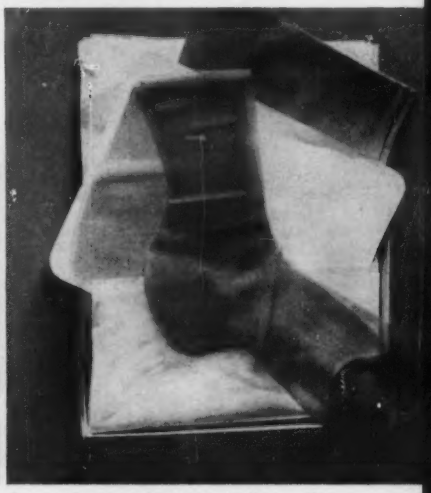
In liquid detergents—to improve tear strength of laundered fabrics.



In laundry rinse water—to improve tear strength and hand of washables.



On auto window linings—to reduce friction of liners against glass.



As anti-snag treatment—for nylon hosiery, sweaters, other textiles.

Latest research studies indicate many new uses for A-C® Polyethylene, the finishing additive so well-known for "taking the tear out of wash-and-wear."

Tests on a variety of fabrics (cotton, rayon, wool, nylon, polyester, acrylic, glass fiber) show substantial increases in tear strength and abrasion resistance when finishes contain A-C Polyethylene. Marked improvements in antifrictional and "hand" properties are demonstrated too.

Other advantages of A-C Polyethylene: emulsifiable in any system—anionic, cationic, nonionic . . . only small percentages required . . . effective through multiple cleaning cycles.

Ask your textile chemical supplier for a finish made with A-C Polyethylene for your specific needs. Or write for information to: Plastics Division, Dept. 617-TW, 40 Rector Street, New York 6, New York. In Canada: Allied Chemical Canada, Ltd., Montreal.

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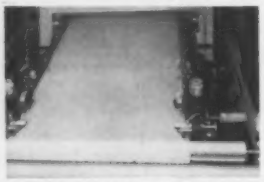
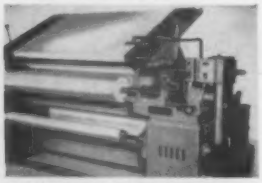


Medium-duty double unit with air sensing, positioning rails on tenter frame for higher speeds.

Photoelectric reflected light head senses cloth position by following printed line or selvage.



Light-duty unit with air sensing, applied to examining machine. Similar unit is used in tubing operation.

★ Highest-speed tentering with minimum selvage and no mis-pinning.

★ Speed up printing operations while you keep accurate side register.

★ Non-clog air sensing head (patented) never touches cloth, works perfectly with all kinds of materials—linty, dusty, abrasive, high-pile, sized, wet or dry.

★ Light-weight or open-weave materials, such as lace, scrim, and gauze, are easily guided, as well as heavy materials such as carpeting and canvas.

★ Can be set to guide on the nap of carpeting, velvets, and other high-pile materials.

★ Cloth edge position, porosity, opacity, or reflectance sensed by air or photoelectric heads.

★ Slit without side trim!

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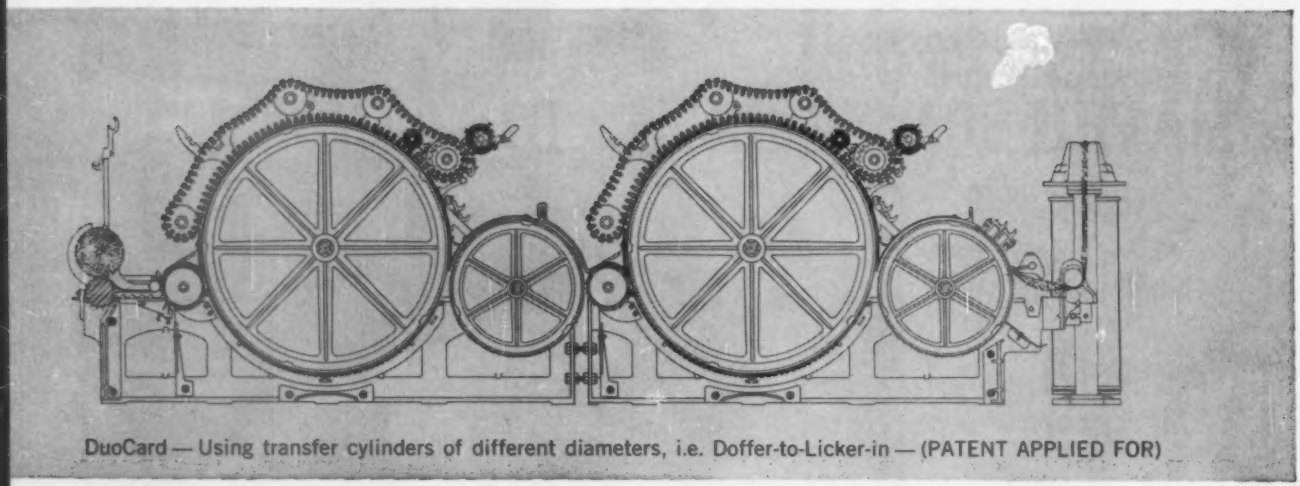
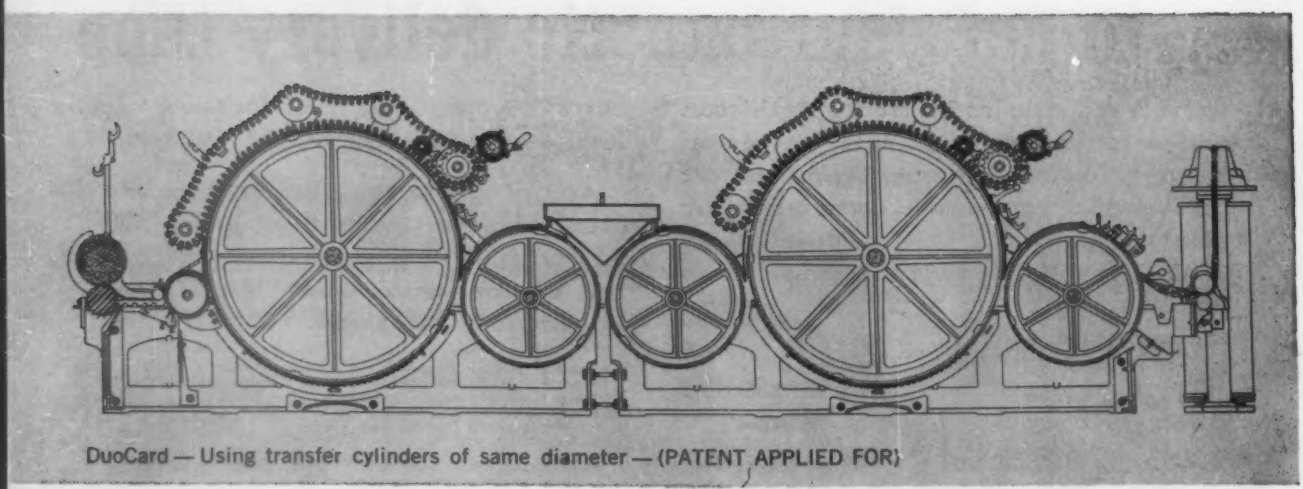


DuoCard — Using transfer cylinders of different diameters, i.e. Doffer-to-Licker-in — (PATENT APPLIED FOR)

Shown schematically, above, is the Saco-Lowell Doffer-to-Licker-in DuoCard (Patent Applied For).



DuoCard — Using transfer cylinders of same diameter — (PATENT APPLIED FOR)

The Saco-Lowell Doffer-to-Doffer DuoCard (Patent Applied For) is also available to mills everywhere through special licensing arrangement.

DuoCard Increases Production, Reduces Floor Space, Sets New High Quality Standards

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Basically, the DuoCard System involves the joining of two standard cards in any one of several ways (see schematic drawings). It is an improvement over double-carding and permits fiber transfer without intermediate sliver formation in a single continuous operation.

As a result, DuoCarded fibers have less neps, are cleaner and brighter, with greater elongation. Fabrics produced by the DuoCard System have a smoother appearance and better hand.

The following comparison, based on actual DuoCard performance in a mill installation, indicates dramatically the superiority of the new DuoCard System:

DuoCard		Standard Card
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55	Grain Sliver	55
22.87	Production @ 100% eff.	8.10
2.55	% Waste	3.87
2.2	U — per cent	3.2

Call in your Saco-Lowell Sales Engineer to discuss purchase of DuoCard equipment, or conversion of your present carding equipment to the DuoCard System, **built for better performance, backed by better service.**

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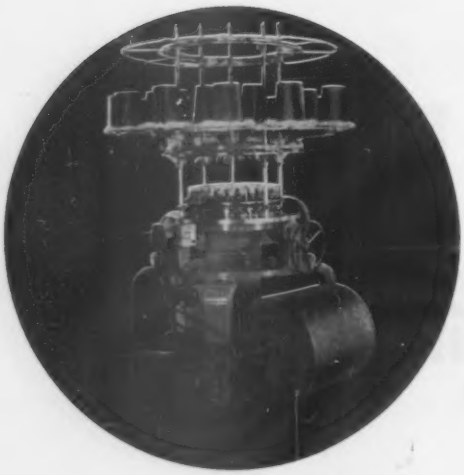

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Let's Talk ABC's

Are you too familiar with the language of management? So familiar that you toss off words without thinking what they mean? If so, you should rediscover the basic truths of managing. Here's help.

A STRIKING and fast-developing phenomenon is taking place in business and industry today: the rediscovery of several important basic facts of management.

Here are the facts company officials are rediscovering:

1. There are basic and experience-proved truths about managing.
2. As managers we have become careless with these truths, largely because we've concentrated on details or fringes. We've acted as though we were well on top of truths and were ready for refinements.
3. There's an urgent need for reminding ourselves—if not actually educating ourselves all over again—on the basics.

OLD FACTS, NEW LOOK

A situation somewhat parallel to our own comes from a far-off place. A team of American management experts recently returned from a year in Turkey helping to raise the level of management knowledge there. One member, with 10 years of experience at the Research Institute of America and the American Management Association, reported this:

"Until I faced facts in Turkey, I had no idea how sophisticated we Americans have become in terms of management. Words, concepts that we use glibly and often had no meaning in Istanbul, Ankara, Izmir. We had to throw out all we knew—or thought we knew—about the practice of managing. We had to ask ourselves such questions as: 'What exactly is meant by terms such as manager, management, managing? In its simplest bone-bare interpretation, what **is** a policy, what **is** planning, delegating, organizing? Why do you have to set objectives? Why does span of control make a difference? What does it matter whether you communicate?'

"Let's take a specific instance. We in America devote a lot of time and energy—not to mention money—studying the best methods for reporting or report writing. But when an intelligent and thoughtful Turkish manager asks, 'What is the purpose, what is to be gained if I make this report to this man?,' you are obliged to dig down beneath your everyday acceptances to come up with meaningful essentials.

"We're told to delegate. Why? We're taught that every manager must develop his subordinates continuously and systematically. Why should he?"

SOFT FACTS, HARD LOOK

That's enough of the report from Turkey. Our profit will come from examining ourselves, our practices, the things we devoutly believe in—perhaps without enough understanding of why we believe them.

What's a manager? Take the case of George Stewart:

George had started in the mill a a young man, pushing truck loads of bobbins, spindles, yarn, and bolts. He'd been interested in the weaving processes and had moved up to helper, operator, and first-class fixer. Now his day had come. He was going to be made assistant foreman of the whole weaving section. The superintendent and the foreman sat him down in the latter's office and said:

"Now, George, you're a manager."

George, having watched other managers in action, knew what that meant. Or did he? Do we?

WHAT A MANAGER IS

If we clear out of our minds all cluttered ideas—faces of supervisors we've liked, others we've not liked, managerial misbehavior of which we've been the victim or the beneficiary—we're likely to decide that a manager is anyone who has authority over the performance of anyone else.

Old familiar words? Not if you take them seriously. Insofar as you give a clergyman the right to tell you how to behave, you make him your manager. If you make your wife responsible for the home decisions, she becomes the manager of the family.

Do you play tennis? In singles, you're on your own. This may also be true in doubles, though one partner often directs the play. But join a team, and you have a manager—someone who makes decisions affecting the team, controls the training, sets rules to follow.

Your baby sitter is a manager while she looks after your child. Your garage man is a manager when your car is in his hands. If one person reports to you, one person for whose work you are ac-

By S. G. WILLIAMS
Management Consultant
New York City

countable, you are also a manager.

What is "managing?" We all know—it's directing people, seeing that the work gets done, controlling, organizing. But—and here we're likely to pause—what is the *core* of managing?

There are all kinds of definitions. All, that is, except what we're looking for now—the kind that sluffs off everything fancy.

Here's a young fellow who starts a shop out in his garage. He's owner, operator, salesman, bookkeeper—the works. Business is good. First thing you know, he's behind. The books don't get kept. A couple of customers call off their deal because they don't get delivery when they should. So our young entrepreneur does some thinking. How could he get help? How would he divide the work if he got someone in to carry part of the load?

At this point the young man is starting to manage! Even before he actually hires his first helper, he is organizing, planning. But these activities are necessary only because now he'll no longer do it all, himself—now he'll guide someone else in doing it.

Draw a large square on a paper. That's the whole job that has to be done—all functions, all responsibilities. If one person can do the whole job, there is no problem. If two people are participating, then draw a line through the square. So far, so good. Which parts of the whole job will you put on one side of the line? Which parts on the other side? You make this decision. With two parts, you must decide the relationship of the two. Will the people performing the two parts have equal authority? Then you have a partnership, and you simply separate the two parts laterally. But if one part performer will have authority over the other part performer, you must bring the subordinate part around and down beneath the other part. Then connect the two with a solid line to show the authority relationship.

While you've been doing this, you've been *managing*. Why? Because you've been active in getting the work done—not doing it, but getting it done by someone else.

This is pretty close to a core definition. Managing seems to be "doing the thinking and producing the product devices of thinking that will result in getting the work done *better* by others."

Here you bring in the entire concept of management development—better systems, better materials, better machines. All these are products of thinking for improving performance of those who operate, execute, build, assemble, maintain, sell, buy, ship, record, or produce results in any other way.

What is management? As we now see, management is a word used to convey two meanings. In one meaning, management is all the managers of a given concern, a given company. In the other meaning, it is, purely and simply, "managing." As one of the managers of your firm, you are a part of the management. When you are managing you are engaged in management.

SOME OF THE WHY'S

Let's take a look at the basic, down-to-rock-bottom reasons for doing some of the things we do when we are managing.

"Why set objectives?" This answer becomes easy, once we've dropped away the frills. Here's a solid-thinking foreman's view:

"I want to achieve certain things in this department. Every man here wants to achieve certain things, but not necessarily the *same* things. One can be heading north for the goal he's after, another south, another west by southwest. They can even be working toward opposite and mutually canceling goals right here in this one department. The only way to make sure that doesn't happen is to *tell* them what the departmental objectives are.

"Why make plans?" It seems obvious they're just road maps to objectives. They tell you when you're aimed in the right direction, when you're moving off course. Did you ever stop to get directions from a farmer along the road? He can accurately rattle off right turns, left forks, groves of trees, horse farms, and hillocks—and two minutes later you're lost again. But if he's a really smart farmer, he'll ask you for paper and pencil and he'll draw a map. You'll be where you want to be in no time. And that is the function of plans.

THREE STEPS TO TAKE

Here are some suggested steps for do-it-yourself development:

1. Forget you ever heard of anything called "management."

2. Pinpoint an action you perform during the day and classify it, preferably not in a traditional way. For instance, you look over a production schedule. What are you doing? What kind of an action is that? Is it how you tell yourself what *you* are supposed to do that day, or what *others* are supposed to do? Is it an assignment-making device? Is it to check on whether your subordinates are keeping up to snuff on their jobs? Are you reviewing, controlling, planning, delegating, organizing, developing?

3. Ask yourself the related question, "Why do I examine this schedule every morning?"

After you've followed these steps on your own activities, you'll find it natural and painlessly productive to look critically at those words that stand for the building blocks, the skills and tools of managing. You'll look at "Controls" and think to yourself:

"Why, 'Controls' are the gadgets we use to tell us when someone or something is straying from the road map, the plans."

"Line and Staff" will provoke a reaction something like this:

"There's nothing mysterious about it at all! Line guys do the producing. Staff guys either tell them how to do their job differently or take on some fringe parts of the line job so line guys can concentrate on producing."

Now you're on your way to a bright, fresh, and excitingly helpful world—the bedrock basics of your management job.

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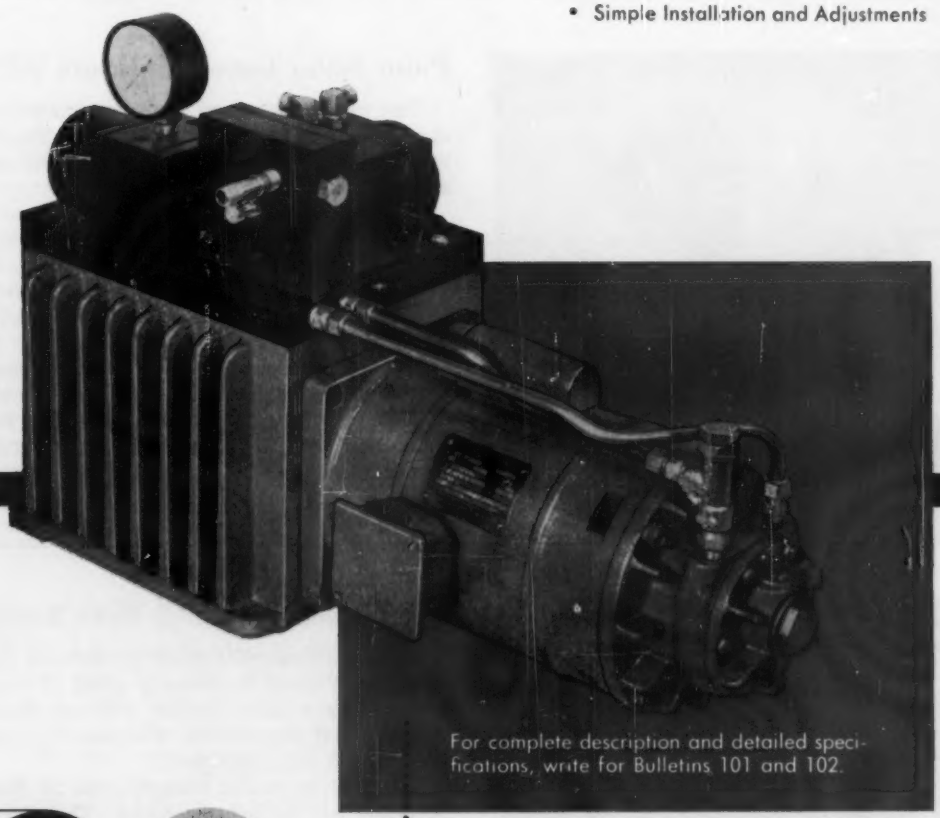

For complete description and detailed specifications, write for Bulletins 101 and 102.

FIFE

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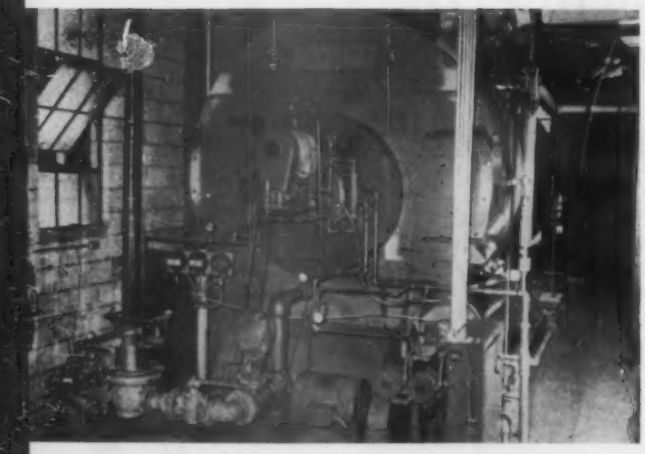
FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 121

TEXTILE WORLD . . . COST CUTTERS



Two-for-One Boiler Swap Saves $14,000

Brookline Fabrics, Inc., Greenville, S. C., is chalking up a neat $14,000 annual saving in steam costs as a result of a new boiler installation. Previously, two smaller package boilers served the needs of the dyehouse. But as additions were made to dyeing and drying equipment, these boilers had to be forced beyond economical limits.

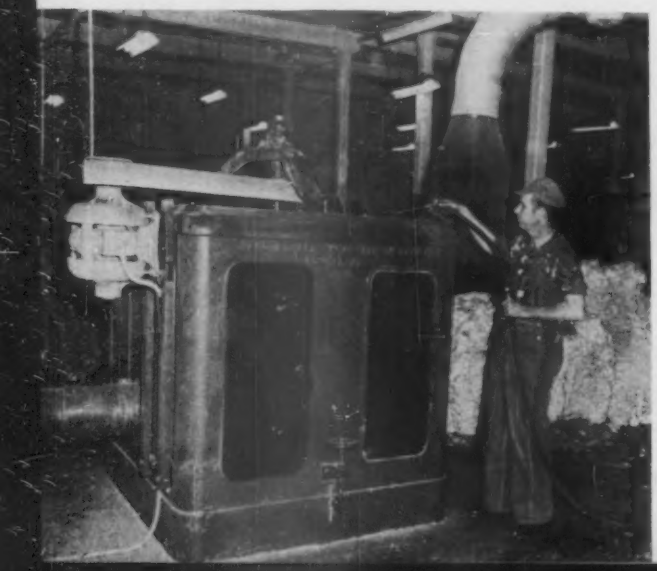
So early this year Brookline put a large package boiler (Superior Combustion Industries) in service as the main steam producer of the dyehouse. Capacity of this boiler is 20,700 pounds of steam per hour. Plant engineer Julius Hertz claims the new installation operates at 85 to 86% efficiency. It is gas fired, has provision for conversion to oil. Automatic controls eliminate the need of constant attention.

Paint Spray Cuts Man-Hours 95%

Two men using a new hydraulic paint-spraying machine (photo) can paint an 8x25-ft. bay in only 4 minutes. It's a paint job that used to take six men 30 minutes to do with brushes.

The new machine (Grayco Airless Paint Spray) is at Abney Mills' Anderson (S. C.) mill. The mill uses the machine for inside and outside work. Inside, the men paint on weekends so they can cover the machines to avoid yarn and fabric contamination from fallout. They paint pipes as well as walls.

The paint sprayer is connected to the compressed-air line of 80 psi. Hydraulic pressure of 2,400 psi. is built up. Lines do not clog with paint. They have to be cleaned only when color of paint is changed or a job is completed.



Opener Removes 25% More Waste

When the Grantville (Ga.) Division of Flagg-Utica Corp. modernized its recently acquired yarn mill, it modified its vertical opener with an improved air chamber that permits the machine to remove 25% more fly and other light waste.

The revolving beater formerly drew air directly from the beater box through the screen. This action created eddies that drew fly and leaf back into the stock instead of into the waste box. But now the air-flow pattern has been altered.

How did the Grantville Division make the change? By simply constructing a special inlet in the air chamber to permit outside air to enter. Increased air pressure stops the turbulence and directs waste into its proper compartment.

Easy-to-Get-at Rolls Speed Processing

Columbus Coated Fabrics Corp., Columbus, Ohio, has speeded the handling of in-process goods and increased usable storage space by adding some new racks and handling equipment (photo). How does this help processing? Rolls are now stored separately, and an operator can get at them easily.

Problem at this plant was digging out specific rolls that required further processing after initial coating. Often a base-coated fabric is finished in one of several printed or embossed patterns. The long runs of semi-finished goods were formerly stored cheek-by-jowl so getting at any one roll often took much time and effort. Now, with the specially designed Louden equipment (Louden Machinery Co.), only one operator is needed to store or remove goods in process.

Film Cuts Packaging Costs 70%

Quaker Meadows Mills, Inc., Hildebran, N. C., manufacturer of coarse yarn and twine, has cut packaging-material costs 3 to 4¢ per unit by switching to polyethylene film. An added extra: Packaging time has been reduced 50%.

Formerly the company wrapped the 50- to 100-lb. tubes of yarn in cardboard and fastened the package with gummed-paper tape. For special product shipments, Quaker Meadows Mills frequently used steel strapping to reinforce the yarn package. The average cost for each package was 5¢ per unit.

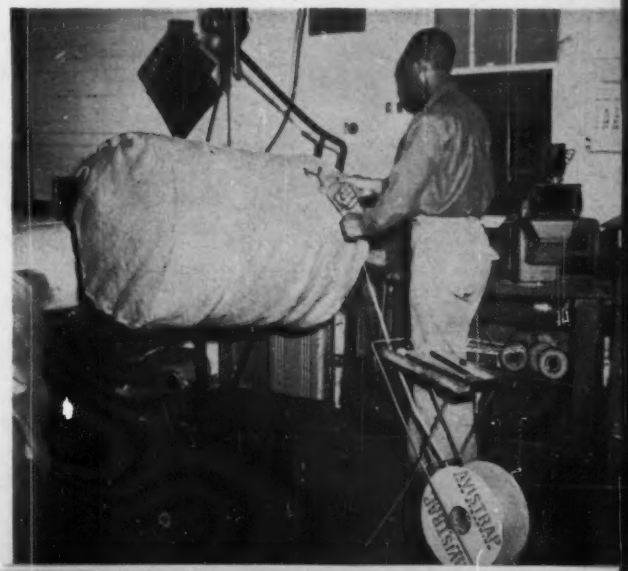
The material the company now uses is TR 101 polyethylene film (Philips Petroleum Co.). The film is 0.004 inch thick. Quaker Meadows uses its own twine to tie the ends of the package.

Strapping Cuts Shipping Damage 50%

Georgia Duck & Cordage Mill, Scottdale, Ga., has reduced shipping damage to its flat transmission belting more than 50% with Avistrap Cord Strapping (Industrial Packaging Department, American Viscose Corp.). In addition, a new portable reel and strapping tool has cut strapping time 20%.

The belting, which often is reinforced with Avisco XL-1 high-strength rayon fiber, is wrapped in burlap and shipped to rubber companies, where backing and covers are applied.

Georgia Duck also likes the strapping because imprinting its company and product name on the strapping builds the company image and aids in identification. Climatic changes after packaging do not loosen the strapping in transit.



COST CUTTERS ... *Begins on page 122*

"Buggy" Speeds Cone Packing 50%

Doffing, inspecting, labeling, wrapping, and packing winder cones are all done in one operation at the mercerizing plant of American & Efird Mills, Inc., Mt. Holly, N. C. What's more, all these steps are done in the winder alleys—not on a long packing table. Result: 50% less time needed for the combined operation, better inspection, and less yarn damage caused by extra handling.

The multiple operation is made possible by the use of a mill-designed "buggy" (photo). The buggy holds a shipping carton and has a built-in wrapping shelf with a container for wrapping paper. Each carton holds an average of 84 cones.

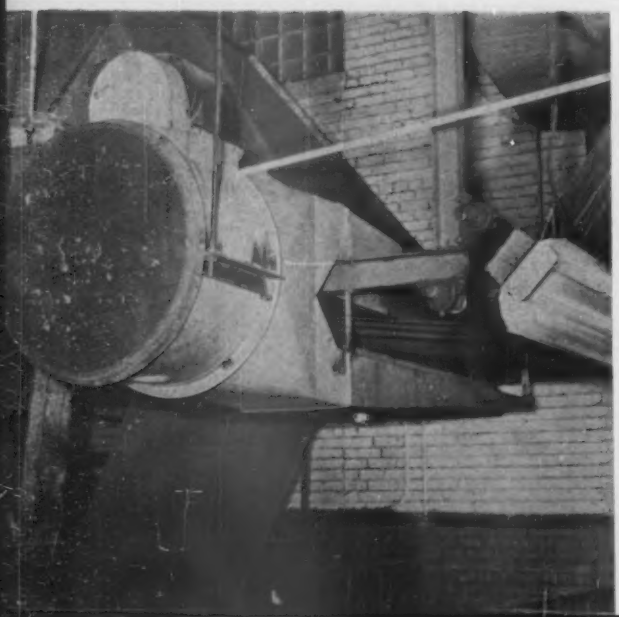
Two girls for each shift handle the output from nine winders.

Worker Efficiency Upped 5%

A new collar-pressing and folding machine at Herbert Mills Co., Inc., Marion, S. C., increases the quality of knitted garments 2%. It also boosts worker efficiency 5%. The machine presses, folds, and places cardboard in the garment collar.

Operators formerly pressed collars by hand with loosely controlled temperature. But with Herbert Mills' constantly improved yarn program—changes in fabric styling and new yarns—Dacron yarns became common in most garments. So closer control of heat for pressing became mandatory.

The company's new pressing and folding machine (Ideal Equipment Co.) operates with electricity, compressed air, and steam. One operator using the machine now presses and folds 3,000 dozen knitted shirt collars per week.



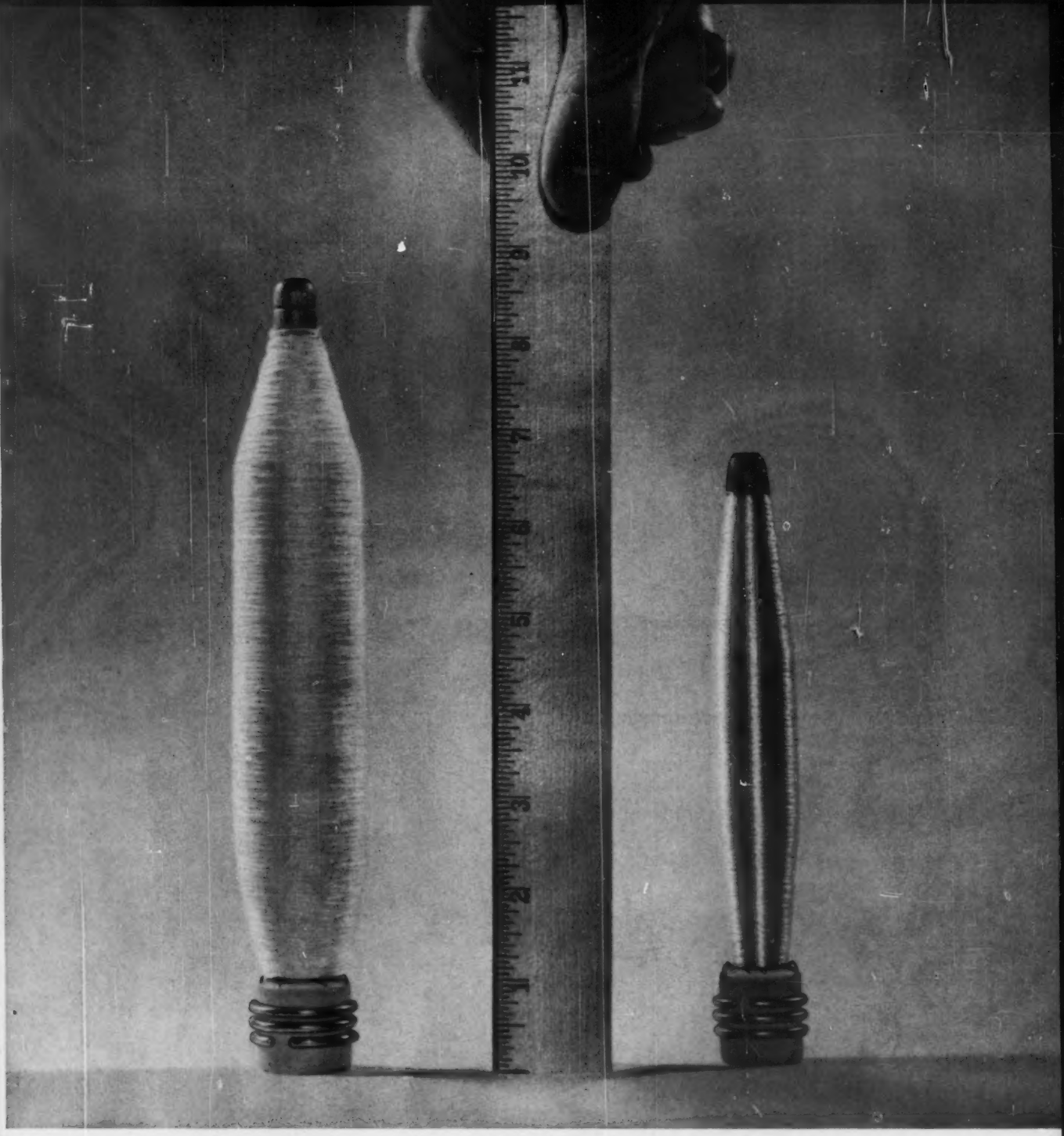
Discarded Fan Cuts Rehandling Costs

Reeves Bros., Bishopville Finishing Div., Bishopville, S. C., uses a discarded dryer fan plus special ducting to cool fabrics blended with Dacron.

Results: No more box marks and other attendant troubles that had previously caused considerable rehandling expense. And it costs less to operate than a stack of drying cans.

Singeing at this plant is a part of the finishing operation. If you plait goods—while still very hot from the singer—into a truck, you can get permanent creases, off-shade areas, and a generally cloudy look on some dyeings.

Cooling cans present the problem of condensate dripping. Plant engineer Benson solved this problem by taking a 1½-hp. fan from an older dryer and building a duct that directs all cool air through narrow slots that point toward the front and back of the goods.



Now UNIFIL is made the way you want it!

By now it's no news to you that the Unifil® stirred up a revolution in weaving when it was first introduced. Because of the way it cuts the cost of weaving while it improves the quality of the fabric, thousands of these versatile loom winders are already in use! And now the Unifil loom winder is better than ever—made the way you want it for use with bobbins all the way from 6¾ inches to 8¾ inches. Look into the latest Unifil improvements and check the way they will change the pay-out picture in your mill. Just call your nearest Leesona Sales Engineer, or write LEESONA CORPORATION, Providence 1, Rhode Island. 1.42

LEESONA LEADS TO BETTER FABRICS

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 125

"I don't know who you are.

I don't know your company.

I don't know your company's product.

I don't know what your company stands for.

I don't know your company's customers.

I don't know your company's record.

I don't know your company's reputation.

Now—what was it you wanted to sell me?"

MORAL:
Sales start before your salesman calls—with business publication advertising.

McGraw-Hill
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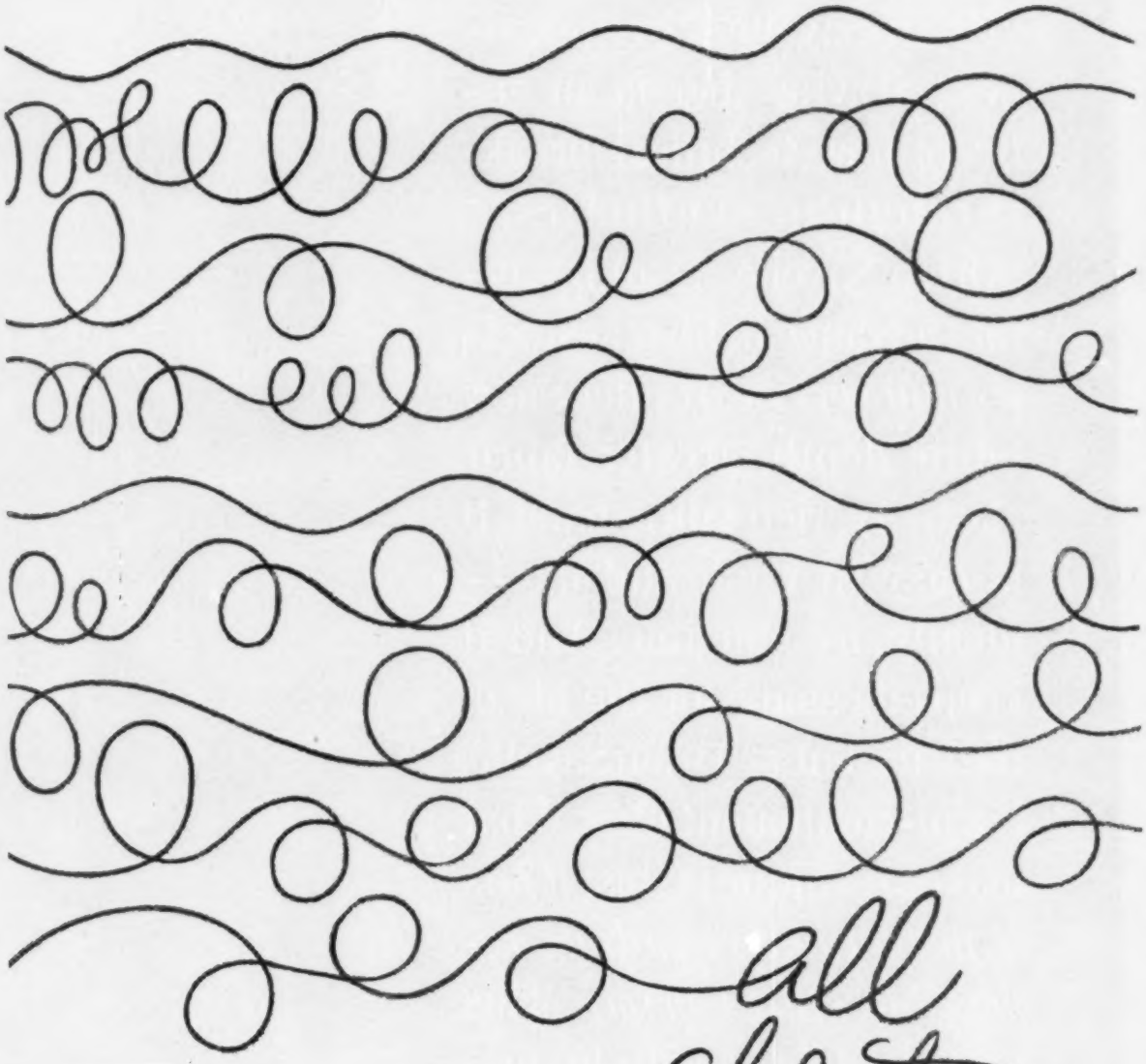
McGRAW-HILL PUBLISHING COMPANY, INC., 330 WEST 42nd STREET, NEW YORK 36, N. Y.



all about "Orlon Sayelle"®

BI-COMPONENT ACRYLIC FIBER

the only fiber of its kind...made today...and made by Du Pont...

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 127

"Orlon Sayelle"* bi-component acrylic fiber is an entirely new technical breakthrough in synthetics. □ "Orlon Sayelle" is an important advance in fiber aesthetics and service. It offers new fabric depth, greater fabric elasticity, rich fabric hand. It is easy to wash and dry—ideally, by machine. And it keeps its shape for the life of the garment. □ "Orlon Sayelle" is a bi-component fiber. What makes it unique is this: *it has a permanent, random, reversible spiral crimp.* This provides fabrics with luxurious beauty, excellent cover and compressional resilience, improved bulk and loft. *Plus* easy care. □ "Orlon Sayelle" was developed by Du Pont Research. Here is why...

Scientists have noted that spiral crimp in apparel fibers can be most important in determining fabric properties. Du Pont researchers applied this basic fact to fiber technology. They combined two separate acrylic fiber components...

...into one. The result: "Orlon Sayelle" bi-component acrylic fiber. When treated with heat and moisture, "Orlon Sayelle"...

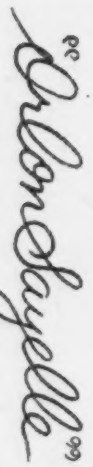
...develops a random spiral crimp. In other synthetic fibers, crimp is imparted mechanically. And, with the tensions of textile processing, some of this crimp...

*Du Pont's registered trademark for its bi-component acrylic fiber.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 129

...tends to pull out. It cannot be regained. When "Orlon Sayelle"* bi-component acrylic fiber is scoured or dyed at the boil, it develops...

...a new crimp. When dry, this crimp becomes permanent, random, reversible and spiral. This is the special advantage of "Orlon Sayelle". Each fiber...



...bulks independently, producing unusual elasticity and recovery. Reversible crimp protects the size and shape of garments, washing after washing. The resilience and springy hand are maintained... With "Orlon Sayelle", you can offer all these benefits plus color versatility, luxury, comfort and easy care (machine-wash, machine-dry, automatic reblocking). "Orlon Sayelle" runs with excellent mill efficiency. It is available in tow and staple form. It can be spun, dyed, knit or woven on standard equipment.

TO SPINNERS, KNITTERS OR WEAVERS. "Orlon Sayelle" offers these advantages and economies: improved cohesion in processing; reduced fly, therefore, less mill contamination; less waste, more yield; increasing economy as you work with it. □ TO THE CONSUMER ON THE BRINK OF A BUY. "Orlon Sayelle" offers texture she can appreciate at a glance; a richness she can touch and enjoy for the life of the garment; full color range; lasting satisfaction in wearing *and* washing; matchless easy-care benefits. □ TO ALL WHO WORK WITH IT. "Orlon Sayelle" offers a powerful promotional advantage. Du Pont is providing extensive advertising support, directed to the trade as well as the consumer. This fall, there's an exciting commercial for men's and boys' sweaters on the "Du Pont Show of the Week"; ads for men's sweaters in Vogue; an ad for boys' sweaters in the Ladies' Home Journal; local newspaper ads for women's sweaters in top metropolitan centers; ads for women's sweaters and knit ensembles in Vogue, Town & Country, Harper's Bazaar; and an ad for children's knits in McCall's. □ And that's only the beginning! For 1962, Du Pont has planned a massive marketing and advertising program (including newspaper and magazine ads and network television commercials). This campaign is designed to promote "Orlon Sayelle" as a leading apparel fiber in women's and children's sweaters; men's and boys' sweaters and sweater shirts; men's, boys', girls' and children's socks; men's and boys' tailored clothing; pile fabric linings; and coat shells. □ Du Pont is proud to present this latest member of the family of "Orlon" acrylic fibers. Count on "Orlon Sayelle", in the year to come, for new opportunities in styling, practicality and profit for *you!*

DU PONT

Better Things for Better Living ... through Chemistry

"Orlon Sayelle"®

BI-COMPONENT ACRYLIC FIBER

Enjoy the "Du Pont Show of the Week", Sunday nights, NBC-TV. *Du Pont's registered trademark for its bi-component acrylic fiber.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 131

With your menswear customers—and their customers—these hang-tags are unmistakable symbols of outstanding quality. Converters, cutters and consumers alike have learned that *Fortrel polyester* and *Arnel triacetate* are positive assurance of lasting good looks with easy care. They bank on these famous Celanese fibers for minimum wrinkles and muss, maximum crease-retention—plus the simplest sort of upkeep.

This broad acceptance is no accident. Celanese backs these great fibers with great promotions. Powerful national advertising—together with all-out merchandising aid—constantly keep Fortrel and Arnel in the public eye. Retailers will be looking for Fortrel and Arnel tagged merchandise next fall . . . be sure these important fibers are in your lines! Celanese Fibers Co., 522 Fifth Avenue, N. Y. 36 (a division of Celanese Corporation of America).

Celanese® Arnel® Fortrel® is a trademark of Fiber Industries, Inc.

Celanese contemporary fibers

What's New This Month in . . .

Fibers, Yarns, and Fabrics

By NOREEN HEIMBOLD, Editorial Assistant, TEXTILE WORLD

New Man-Made Fiber

Does the textile industry have a new man-made fiber? G. F. Chemical Co. has just announced a fine denier multifilament polypropylene for volume ready-to-wear manufacturers. Up to now, most of the polypropylene work in this country has been in staple fibers and heavier deniers for industrial applications, films, carpet fibers, netting, and cordage.

The new fiber is called Gerfil. It will be available in 60 colors and pure white. In addition to spinning filaments in 60 and 120 denier, special equipment can texturize yarn directly on the production line. For the knitter, this means new types of fabrics that will lend themselves to many surface treatments and effects.

Pilot production of the new fiber will begin in March. Full commercial operations are set for July. Sample qualities are now available to knitters and weavers.

Blended Double-Knits

For the first time knitters can get a double-knit fabric with a polyester fiber. The new fabric, a blend of 60/40 Kodel, wool, will be introduced in spring '62.

It pleats permanently and can be machine washed and dried. Called Double Pique, the fabric is available in a 60-in. width and weighs 13½ to 14 ounces per linear yard. Colors include gray, white, red, black, beige, cafe au lait, tan, and light, bright, and navy blue.

Nonskid Coating

Here's a new method for translating raw elastomer into a spandex-type finished fabric. Bauer & Black, division of The Kendall Co., developed the process.

The raw polyurethane, when applied to fabric, is deposited in such a way that the particles are not completely coalesced in the coating. The result is an indefinite number of pores giving breathability. Since the surface is soft but not completely smooth, polyurethane provides nonskid anchorage.

As the volume grows, there will be no problem in obtaining supplies of raw material—polyurethane.

It's slated for use in apparel as well as in foundations.

Big Deniers

Fibers or freaks? American Cyanamid is trying to answer this question for a series of heavy-denier acrylic staple fibers it has developed. The new fibers range from 20 to 80 deniers—higher than any fibers now in general use in apparel or home furnishings. The 80 denier is so pliable that a tight knot can be tied in a single filament without breaking or cracking.

Good color fastness can be achieved, although a longer dyeing time is needed. Preliminary interest has centered on its possible uses in floor coverings, pile fabrics, felts, and industrial woven and nonwoven fabrics.

Spandex Improves

Eastman Kodak Co. is evaluating a new elastic fiber with a higher modulus than any current spandex fiber or rubber. It resists heat deterioration and discoloration from chlorine-type bleaches and atmospheric fumes.

Tenacity, though similar to that of spandex fibers, is double that of rubber.

The new yarn, which is a monofilament with a circular cross section, can be dyed to fast colors with dispersed dyes.

Two Tone Nylon

Now mills have two new types of carpet fibers—a deep-dye nylon and dye-resistant material, developed by Chemstrand.

Both the deep-dye and the dye-resistant nylon will increase the mill's styling potential. When you use the deeper-dye nylon, you can make carpets with tone-on-tone combinations, color-and-white patterns, and three-color styles.

Through the use of acid dyes, deep-dyeable nylon takes a darker shade.

When the dye-resist material is applied to carpets, the nylon stays white in acid dyes, but it accepts disperse dyes. The material can be applied in a pattern, spray, package, or skein application. A wide variety of color effects is possible when the carpet is put into a single dye bath.

NEWS BRIEFS . . .

Hot-work gloves—Take Canton flannel and terry cloth and aluminate them. That's just what Newton Glove Mfg. Co. did. The result is a new glove that will reflect and diffuse heat without peeling, cracking, or discoloring.

New rayon combinations—Now you can get an American Bemberg filament yarn (novelty or plain) combined with any other filament yarn without twisting. When you vary types and colors of yarns to be combined, you can achieve different textures, weights, color effects, and patterns. The process, called Cuprel, produces lustrous yarns.

Upped strength—Du Pont has developed a new type of Dacron industrial yarn that has up to 20% more rope break strength than present types. It's priced at $1.53 per pound and is available in 1100 denier.

Sure-care symbols—They show the housewife how to handle garments. They give warnings such as:

- Use warm water wash.
- Don't dry clean.
- Use warm iron.
- Don't tumble dry.
- Don't wring out.

Chromspun, Estron, Verel and Kodel are Eastman fiber trademarks

the stamp of quality in modern fibers!

Textile Division Offices:
New York, N.Y., 260 Madison Ave. | East Providence, R.I., 888 Broadway | Greenville, S.C., 1912 Augusta Road | Ft. Washington, Pa., Ft. Washington Industrial Pk. | Greensboro, N.C., 435 Jefferson Standard Bldg.

EASTMAN CHEMICAL PRODUCTS, INC., *subsidiary of Eastman Kodak Company*, KINGSPORT, TENNESSEE

Big things are happening with HERCULES®

POLYPROPYLENE

olefin fiber

The lightest of all fibers—Hercules polypropylene—is now a commercial reality. More and more technicians and designers are visualizing the benefits of its unique combination of properties in terms of new and improved textile products. Numerous fabrics now under development—woven, nonwoven, tufted and knitted—indicate clearly that you can profit from the qualities of this new man-made fiber. Hercules polypropylene offers: **1.** High tenacity. **2.** Light weight. **3.** More coverage per pound than any other fiber. **4.** High resistance to flexing. **5.** High resistance to abrasion. **6.** High resistance to chemical attack.

This remarkable fiber can create new market opportunities in great variety. With proper development, high-volume uses may include products as different as floor coverings, industrial fabrics, work clothes, coated fabrics, upholstery, and pile fabrics. We are now spinning Hercules polypropylene fiber commercially in three forms: continuous multifilament yarn, staple fiber, and tow...bright and semi-bright lusters in natural and solution spun colors. The detailed physical properties, denier tables, comparative coverage data, and other facts will help you evaluate markets. Ask for them.

Call or write:

HERCULES POWDER COMPANY
INCORPORATED

Fiber Development Department
380 Madison Avenue, New York 17, New York
Branch Office: 1214 Wachovia Bank Building, Charlotte, North Carolina

FP61-2

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 135

TEXTILE WORLD . . . News From the Mills

Textile Firm Moves Into Container Business

Deering Milliken Inc. is taking its first diversification step outside the textile business.

The company is acquiring exclusive U.S. rights to patents and trademarks of Tetra Pak Co., Inc., Union, N. J., a branch of Ackerlund & Rausing of, Lund, Sweden. Tetra Pak is the trademark for patented containers, machinery, and materials used in the packaging of milk and other liquids. The packaging material is a product of cellulose and polyethylene.

•

Speed Machinery Buying

Take a look at these new machinery purchases—and at the mills that will benefit from the lower depreciation rates announced in October:

Avondale Mills, Sylacauga, Ala., is plunking down over $1-million for 44 new roving frames. From a dollar volume this is the largest single order for roving equipment ever recorded by Saco-Lowell Shops.

Ten new looms are on order for **Schoolhouse Textiles,** Wilkes-Barre, Pa., to expand the company's upholstery, drapery, and men's wear fabrics operations.

Powell Knitting Co., Spartanburg, S. C., is installing an integrated knitting unit to produce industrial fabrics for the coating trade. It has ordered 12 Supreme knitting machines and finishing equipment.

•

$4-Million for Growth

To meet competition, textile mills are rapidly stepping up modernization expenditures—nearly $4-million announced this month.

With a $385,000 expansion program, **William E. Wright & Sons Co.,** West Warren, Mass., will increase its weaving facilities by over 20-million yards a year. The company also is building an $85,000 fully automated vat dyeing machine. The company will do all dyeing operations in this machine at the rate of 2,400 ypm.

The textile division of **United States Rubber Co.** is expanding and modernizing for the eighth time this year. It will spend approximately $1-million at its **Stark Mills,** Hogansville, Ga.

Spartan Mills has nearly completed its $1,200,000 modernization project. The money was split among the following three (S. C.) plants: Beaumont, $750,000; Startex, $250,000; and Spartan Mills, $200,000.

Alamac Knitting Mills, Inc., is constructing a $1.4-million plant in Lumberton, N. C. When operations begin, the company intends to employ 1,000 persons.

•

The last textile manufacturing company in Cincinnati is moving out of the city.

Adler Co., a 100-yr.-old hosiery manufacturer, will move to a plant in Rockwood, Tenn. Reasons for the move: to be closer to market and labor supply. The company is moving some employees to Rockwood. Adler has been owned by Burlington Industries since 1959, but operates independently of the parent company.

•

A U.S. shipping and brokerage firm is moving into the textile business—in Ireland.

T. J. Stevenson & Co., New York, will establish a subsidiary, **Ulster Textile Mill Ltd.,** at Newry, Northern Ireland. The plant, leased from the Northern Ireland government, will make carded cotton yarns.

•

"Shape cloth" fabrics will soon start rolling out of the mills of **J. P. Stevens & Co., Inc.** The company has purchased from Timely Clothes the rights to a heat-and-chemical process that gives stretch to all-wool fabrics. Stretching results when the hot-wet process is coupled with special twist yarns woven 10% farther apart, then finished to normal counts.

•

Bids to buy the Rossville (Ga.) unit of **Peerless Woolen Mills** did not come up to expectations. So Peerless, a division of Burlington Industries, Inc., will sell machinery, equipment, and real estate piecemeal.

•

Indian Head Mills (Puerto Rico) has temporarily suspended operations in Ponce. Two reasons: High raw-cotton support prices and low print-cotton prices in the mainland market. The firm has also shut down its recently opened factory in Mayaguez.

•

Crown Woolen Mills Corp. will be liquidated because it can't "compete with the overwhelming surge of imported fabrics." The firm, an 80-yr.-old manufacturer of woolen tweeds and shetlands, has recently been operating on a limited basis.

•

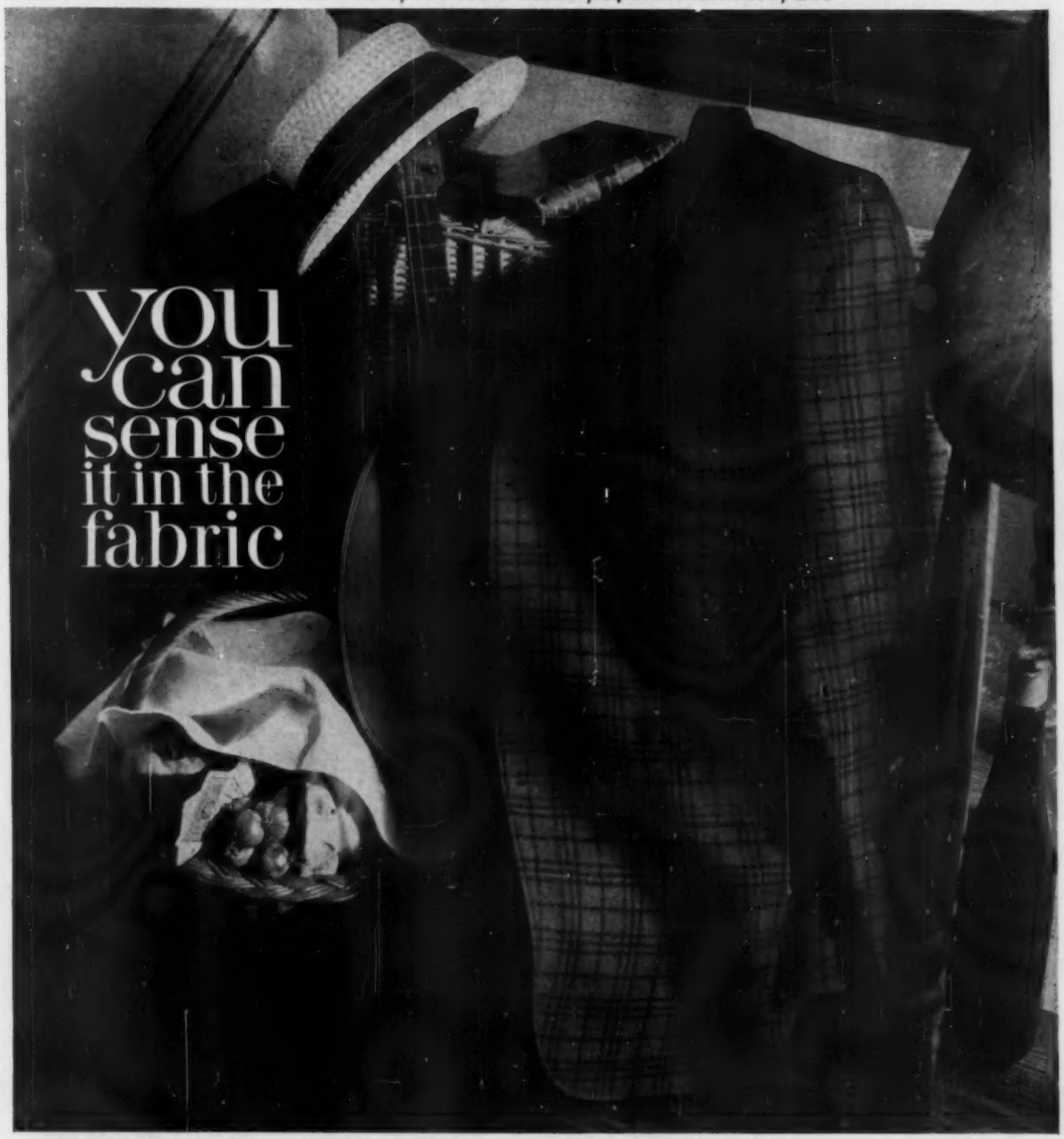
A growing demand for Vyrene, **United States Rubber Co.'s** new synthetic elastic thread, has prompted a new expansion program. The company will increase production facilities at its Gastonia (N. C.) plant by 35%.

•

News Shorts

Mt. Vernon Mills, Inc., Baltimore, and its selling agent, Turner-Halsey Co., New York, have merged. Previously Mt. Vernon owned 80% of Turner-Halsey's stock. . . . **Textile Mills Co.,** Chicago, has purchased Barbara Products, Inc., Mt. Vernon, N. Y. Textile Mills produces ironing board covers and pads. . . . **William L. Barrell Co.,** New York, has bought the Glendale (S. C.) mill of Indian Head Mills, Inc. . . . **Archibald Holmes & Sons,** Philadelphia, is the new owner of the Carolina Carpet Mills, York, S. C. . . . Kings Mountain, N. C., is the site of a new hosiery mill, **Ideal Hosiery Mill Inc.**

AS APPEARING IN: New York Times, The New Yorker, Sports Illustrated, Life



The Vitality of Creslan...the fiber with the six senses of fashion.
Vitality is one of the six senses of fashion. It is animation, verve, endurance...an unquenchable spirit. It can stand up to life, because it is the very breath of life itself. Now, Creslan acrylic fiber is breathing this lasting liveliness into everything from clothes to floor coverings. Creslan sparks fabrics with new color vibrancy, helps wrinkles disappear, keeps fashions fresh and neat with least care. Look for them. You'll enjoy all six senses: vitality, lightness, color, taste, touch, and beauty. American Cyanamid Co., N.Y.

Offices: 111 West 40th St., N. Y.; 3333 Wilkinson Blvd., Charlotte, N. C.; 2300 South Eastern Ave., Los Angeles, Cal.; 40 Fountain St., Providence, R. I.

CYANAMID
Creslan®
LUXURY ACRYLIC FIBER

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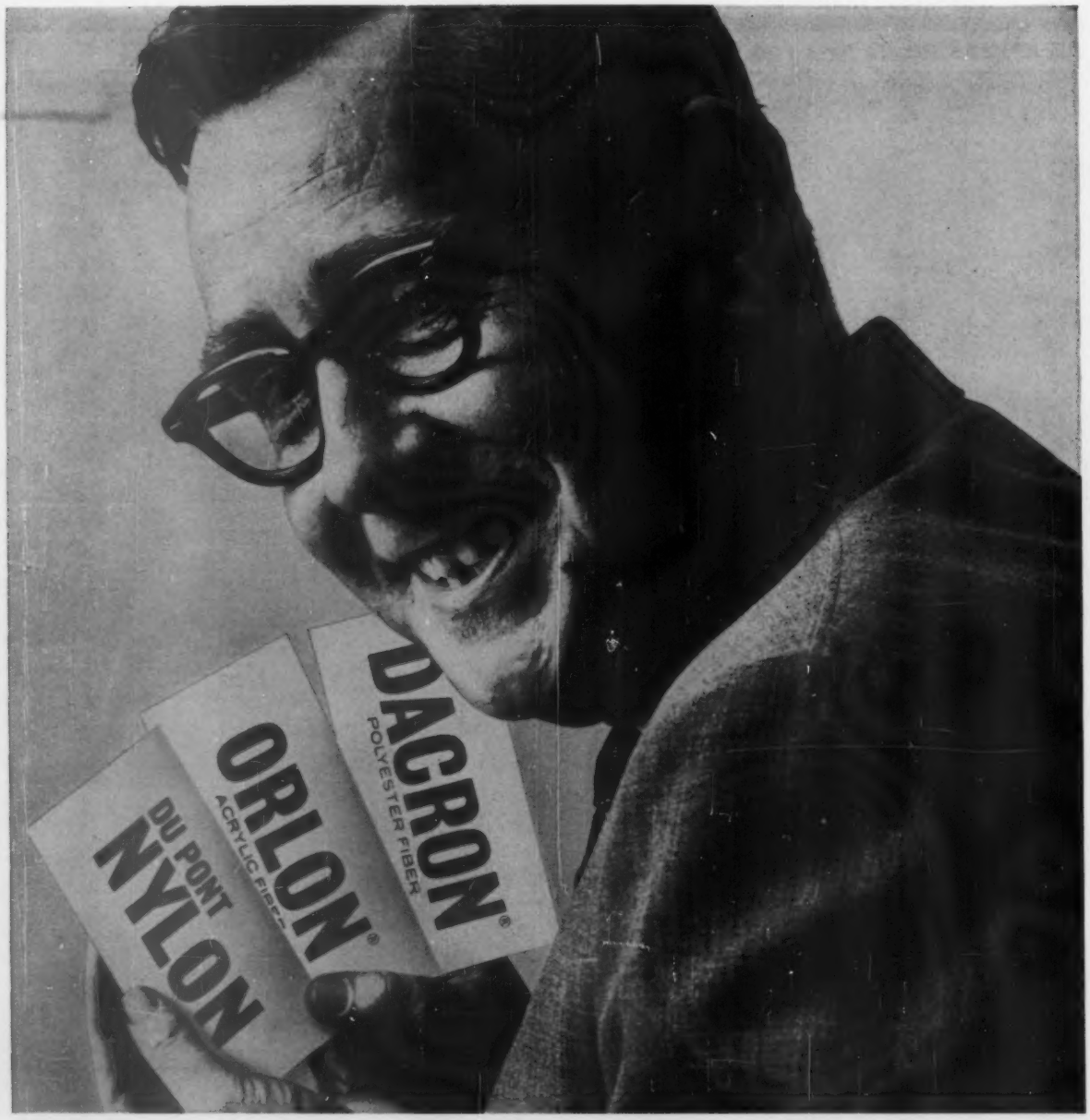


What a hand!

... Nice to hold a strong hand, isn't it? You have to play it smart, of course, but the odds are with you... Same deal in fibers. The right fibers can give your merchandise a powerful head start. And the right fibers, we submit, are Du Pont fibers. They're known, trusted and preferred by your customers. And they're nationally advertised on TV and radio, in magazines and newspapers... Yes, the trump cards are yours when you feature Du Pont fiber trademarks on your labels, in your advertising and in your selling plans.

GET A SELLING EDGE WITH DU PONT NYLON "ORLON"* (ACRYLIC FIBER) "DACRON" (POLYESTER FIBER)**

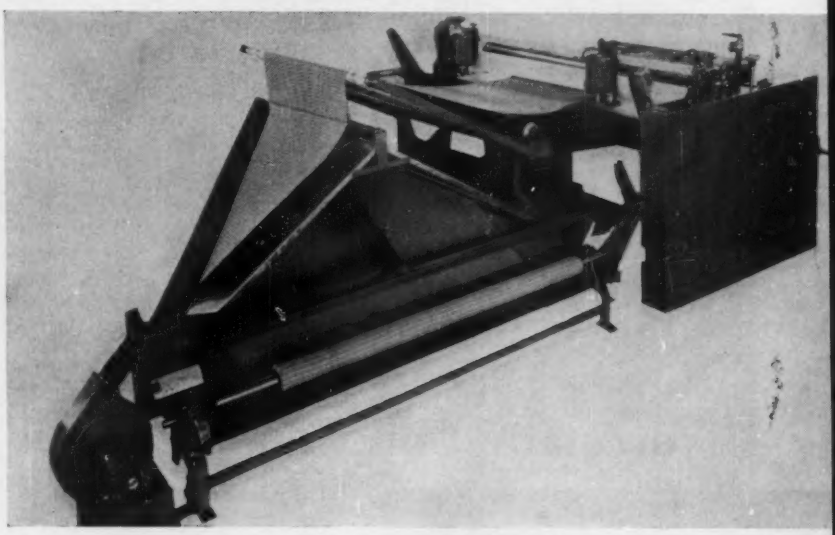
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY DU PONT

Enjoy the "DU PONT SHOW OF THE WEEK", Sunday nights, NBC-TV. *Du Pont's registered trademark for its acrylic fiber. **Du Pont's registered trademark for its polyester fiber.

TEXTILE WORLD . . . Equipment and Supply News

For more information on any of these items, write the appropriate number on the Reader Service Card, next to the back cover.

Two Jobs at Once—and Non-Stop, Too



This machine does two jobs, calendering and slitting, in one continuous operation. Joseph Pernick Co. offers the unit in 42- and 72-in. models.

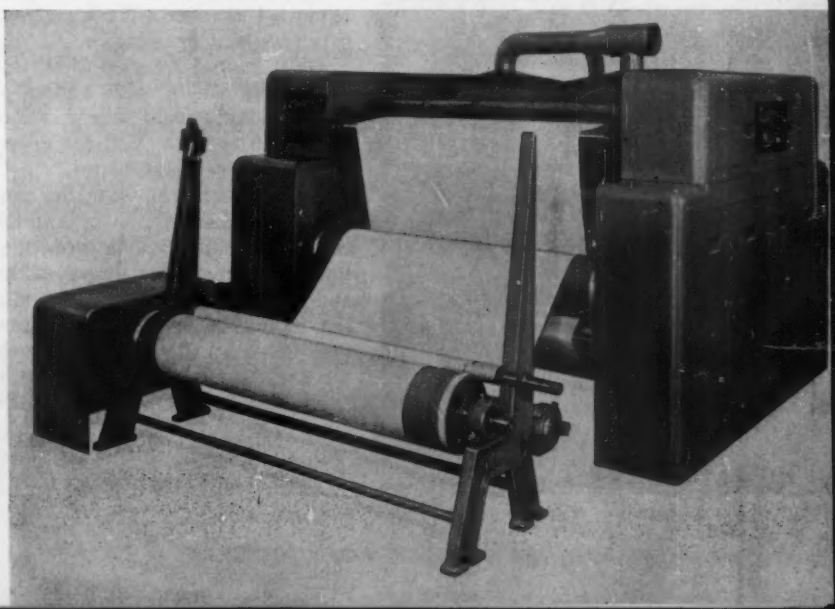
Each model handles all types of tubular knit fabrics including plain jersey, elasticized knitwear, and double knit. Operating speeds for the 42-in. model range from 20 to 50 ypm.

The calender section of the machine has a cloth spreader (at the feed end), top and bottom steam boxes, and a main roller that you can heat or leave cold. The slitting and opening portion has a cutter (it's a side slitter) at the end of the calender, an opening unit, and a cloth take-up.

Because the complete calendering and slitting operation is tensionless there is no edge curling even on the lightest fabric.

The 72-in. model has special features for handling cloth for laminated or bulky knits. You can double cut fabrics because there is a cutter at each edge. And the fabrics roll separately with the faces on the outside. This unit also has a blower on the opening section for handling bulky knits. **(Write E-1 on Reader Service Card.)**

Shears Both Sides in One Run at 190 YPM.



A high-speed machine, Model M-130, shears both sides of the fabric in just one pass at 190 ypm. After thoroughly testing the shear, Curtis & Marble Machine Co. recently introduced it with four sets of cutters to attain the high rate of production.

Because of the high output, you need a large scray capacity to feed the unit. With 180-yd. loom rolls you need a 23-sec. time cycle for sewing the pieces together.

The machine can shear 50-in. fabric (print cloth or broadcloth) at an hourly production of 10,000 yards. **(Write E-2 on Reader Service Card).**

. . . *Turn the page*

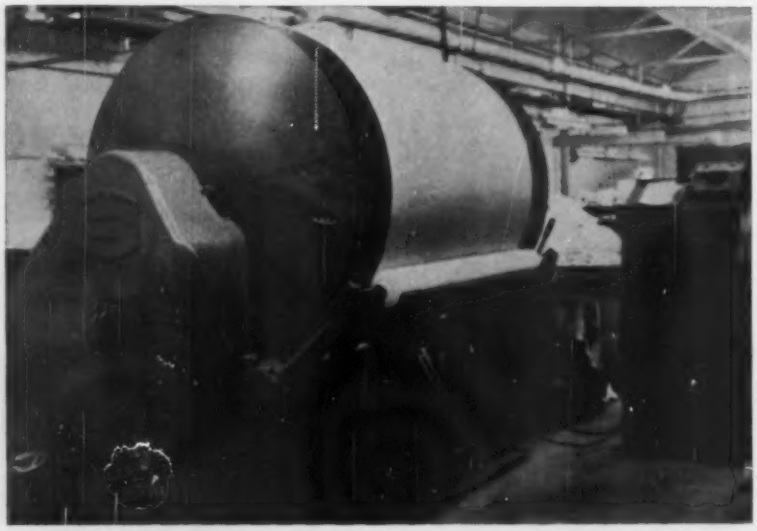
For more information on any of these items, write the appropriate number on the Reader Service Card, next to the back cover.

Now—Tensionless Piece Goods Inspection

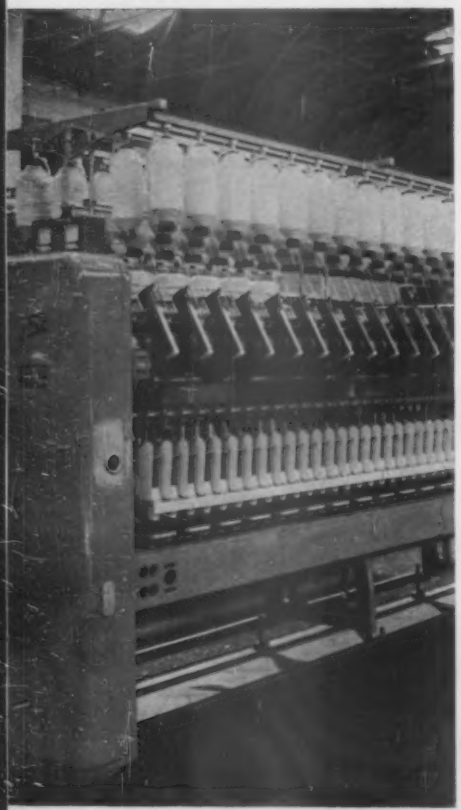
This inspection machine uses a large-diameter drum to carry fabric from cloth roll to delivery roll. Result: tensionless inspection and accurate measuring.

The Jerisfab machine, made by G. Durrant Sons, Ltd., handles any type of web including lace, tricot, film, woven, or nonwoven. You inspect the fabric as it moves with the big drum, thus you can easily detect faults. When necessary, you can reverse the machine.

A control panel contains the measuring recorder and has a 3-to-1 variable speed. There's a dual control at the rear for threading up. The machine stops fast because the electric brake is on the motor. **(Write E-3 on Reader Service Card.)**



Hydrostatic Unit Cuts Vibration



This spinning frame features ball-bearing spindles with hydrostatic devices to absorb high- or low-frequency vibrations. The unit, made by Nazionale Cogne S. A., runs at 4,000 to 14,000 rpm. on 6s to 100s count yarn. Each pulley drives two spindles per side. Spindles have toggle-joint brakes.

Draft stand is positioned at 60 degrees. All rolls are ball-bearing mounted. High-draft bottom apron is tension mounted. The rigid pressure rolls are releasable.

Draft ranges from 8 to 40 for any staple length with cotton or blends. Preliminary draft varies from 1.20 to 2.70. You can adjust twist between 6 and 40 tpi.

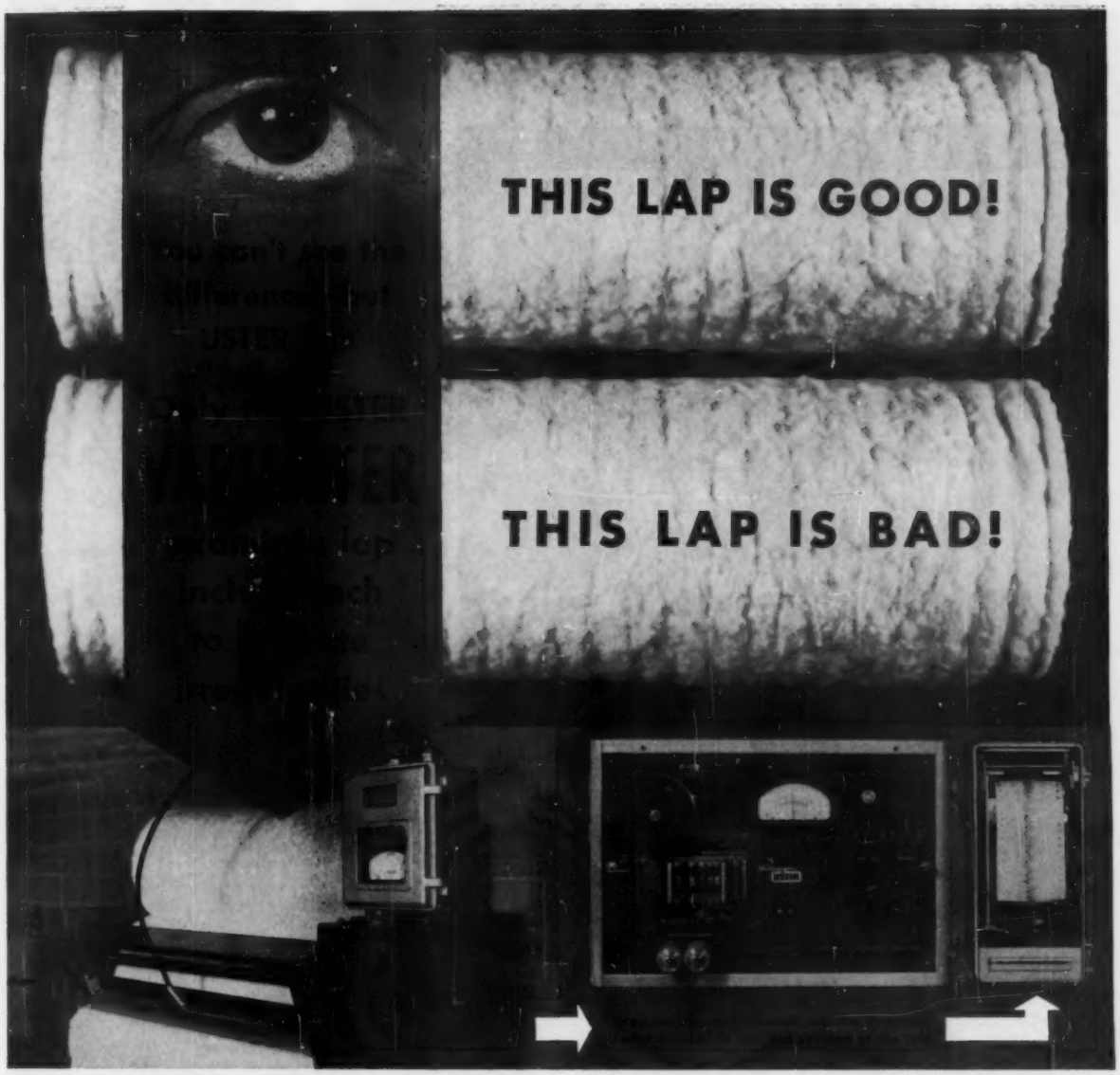
To avoid feed-roll wear, the condenser that guides the sliver is varied continuously by a long slow motion. The frame has thread guides and anti-ballooning devices. It also has a built-in, broken-end suction unit. Air from the suction fan cools the motor.

Gage is 3 or 3½ inches. Spindles take 11¾-in. bobbins. Motor for 400 spindles is 15 horsepower. **(Write E-4 on Reader Service Card.)**

E-5—Starch cooker, tied in with a bulk-handling system, automates size preparation from rail car to size box. This modified Nemo jet cooker gives continuous fresh size with uniform temperature and flow at reduced cost. The self-contained unit has a slurry pump and a supply tank. Optional accessories include means to inject softeners or conditioners and a paste flash chamber at the size box. The unit is 36x27x65 inches. For special installations you can sectionalize the cooker and mount it overhead. Corn Products Sales Co.

E-6—Spinning frame has been modified so it can spin coarse or fine yarns (2s to 120s) with any fiber or blend. Spindle speeds go to 15,000 rpm., drafts from 10 to 60. It has a new ball-bearing undercarriage, broached arms, and new spring counterbalances. The traverse mechanism has been simplified with fewer parts. The new ball-bearing head and head-end draft gearing give a full range of drafts and twists with one-fourth the number of change gears formerly used. Result: quicker change-overs. Roberts Co.

. . . *Turn the page*



Notice the two laps pictured above. You can't tell any difference between them, can you? They both look exactly alike, and yard by yard, they both weigh the same. Yet, one is a good lap and one is a bad lap. You may not see any difference now but you will in your finished yarn. One inch of bad picker lap will make 650 yards of 30's yarn with excessive count variation.

The simplest and most effective means of controlling yarn size is inch by inch measurement of the picker lap. The Varimeter enables an accurate tracing and subsequent elimination of picker faults. The Varimeter is versatile. It can be mounted on the picker or on an unwinding device located in the picker room or in the laboratory at the option of the mill.

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EVENNESS TESTER • INTEGRATOR • SPECTROGRAPH • IMPERFECTION INDICATOR
VARIMETER • STRENGTH TESTER • SPECTOMATIC • WARP PREPARATION EQUIPMENT

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CONTINUOUS QUALITY CONTROL IS ABSOLUTELY ESSENTIAL FOR EFFECTIVE MACHINERY MANAGEMENT. A FULLY EQUIPPED USTER EVENNESS CONTROL SYSTEM IS LITERALLY THE NERVE CENTER OF AUTOMATION.

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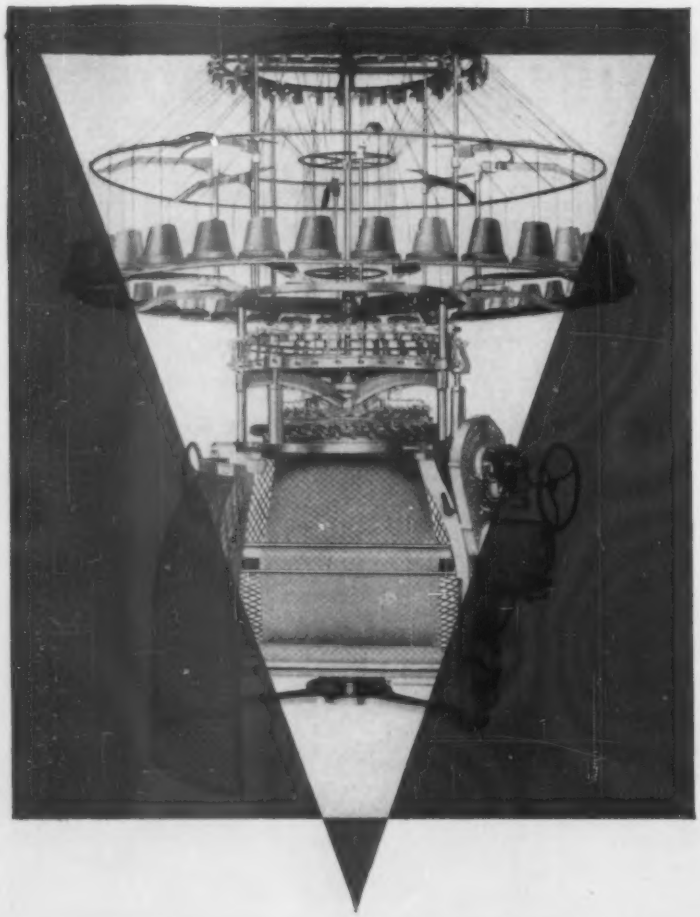
SUPREME



Double-Pique Fabric Up To 20 Yards Per Hour

Other Fabric Up To 40 Yards Per Hour

Write for free booklet on this important advance in the interlock field

UNEQUALLED VERSATILITY

30" dia., 36 feeds in cuts through 16 needles per inch—produces "Double Pique" and "Grenadine" fabrics; "Blister" stitches, plus a tremendous range of other patterned rib or interlock.

50% GREATER PATTERN AREA THAN ANY OTHER MACHINE

Plus a spectacular range of patterns and textures. Wheels available for special pattern fields, (L shaped, argyles, etc.).

SOME OTHER MODELS IN THE SUPREME LINE OF PROFIT-KNITTING MACHINERY—

MODEL MJ/N—Wide Diameter & Body Size Jersey

MODEL MLVP/N—Pile, Loop, Plush, Plaited Patterned and Velveteen

MODEL ROF/N—Jacquard-Type Floatless Patterns

MODEL SAI-PP—Striped and Patterned 1 x 1 Rib—Also Swiss Rib and Interlock

MODEL SAAF-C/N—Plain, Variable Striped and Patterned Jersey

MODEL BRW—1 x 1 and Half Cardigan Plain and Patterned Bulky Fabrics

MODEL IRW-2

Unsurpassed Versatility In

"DOUBLE-JERSEY" "DOUBLE-KNIT"

Rib And Interlock Production

For further information or a demonstration of this machine in action, contact Supreme.

SINGER-SUPREME CO., INC.
A Subsidiary Of The Singer Manufacturing Co.
94-02 104th St., Ozone Park, N. Y.

Southern Office:
P.O. Box 342 MacArthur Circle, Monroe, N. C.

SIMPLIFIED CONTROLS

Easily adjusted to control both fabric elasticity and surface "birds-eye" effect. Can be readily set to produce pique fabrics in Swiss, French or other constructions.

DUAL RACEWAY

Needles of either raceway may be independently set in knit to tuck or knit to welt positioning.

AVAILABLE WITH

(1) "ROLL-O-MATIC" FEEDING DEVICES —Permit use of wide variety of yarns—Maintain uniform tension at knitting points, (2) VARIABLE SPEED MOTOR—For R.P.M. changes at the turn of a lever.

Plus All SUPREME Standard, Mill-Proven Construction Features

SR-109

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Equipment and Supply News

. . . *Begins on page 139*

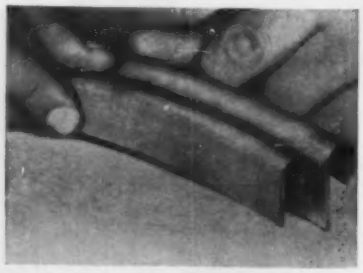
For more information on any of these items, write appropriate number on the Reader Service Card, next to the back cover.

E-7—Radiometer measures temperature on moving fabric and rolls without touching them. An optional sensing head collects infrared energy that is converted, by the 10-lb. battery powered unit, to a dial temperature reading. Williamson Development Co., Inc.

E-8—Laboratory refrigerator, 34½ x23x20 inches, needs no ventilation. The hermetically sealed cooling system is guaranteed for 5 years. The 4 cu.-ft. unit uses 115-v., 50 to 60 cycle a.c. The door has no protruding hardware. Fisher Scientific Co.

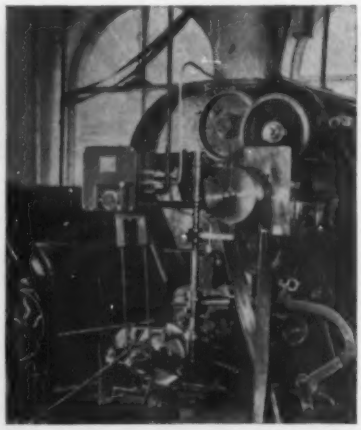
E-9—Spherical tank, made of glass-reinforced polyester, can be used for processing or storing corrosive liquids. It weighs ¼ that of a comparable stainless-steel tank. It's available in diameters of 6 feet (847 gallons) and 8 feet (2009 gallons). Justin Enterprises, Inc.

E-10—Camera fits any microscope. It uses 35-mm. film, with 36 exposures in each magazine. You can change the film magazine at any time or place—and change exposures on color film to black and white in 2 seconds. You can operate the camera rapidly by foot pedal as you view the sample through the microscope and make adjustments. Exposure time: 1/100 second to over ½ hour. E. Leitz, Inc.



E-11—Top ring for roving cans is two to three times stronger than previous designs. On a 20-in.-dia. can, the ring is made of 2-inch wide, 14-gage galvanized steel. This compares to a 1½-inch, 16-gage one designed previously. National Vulcanized Fibre Co.

E-12—Pushbutton switch is used as an emergency stop station or a multi-switch starting station. It features a 5-in.-dia. bright-orange button. You can operate it by hand or foot. Button acts as a cover for Type D switches. A bellows seal around it prevents foreign material from entering the switch. It comes with two ¾-in. pipe-tapped conduit threads for straight-through wiring. Cutler-Hammer.



E-13—Warning device, for wool carding, detects incorrect weights before they happen. Unit increases accuracy by insuring that weighing occurs in most favorable part of cycle. It also detects under- or over-filling of the hopper. A dual indicating light gives warnings—amber shows over-filling or early weight-pan drop, red shows under-filling or late weight-pan drop. Electrical Productions (Leeds) Ltd.

E-14—Plastic-pipe fitting resists corrosion, prevents vacuum-line leaks, needs no electrical insulation, and reduces weight. It is available in Zytel, Teflon, PVC, Profax, polyethylene, Plaskon, Penton, Kel-F, and Delrin. Sizes range from $\frac{1}{16}$ to 1 inch. Cajon Co.

E-15—Starter, NEMA Size 5, has all connections on the front for easy and quick installation. It has solderless pressure-type terminals. Because of its straight-through design you don't bend the wire around the starter. By turning a knob you can adjust overload relays ± 15% of the normal heater rating. This bimetallic relay is trip free—you can't close the circuit until the motor cools. Enclosure has knockouts for indicating light, pushbutton, or selector switch. Rating: 200 horsepower at 600 volts. General Electric Co.

. . . *Turn to page 148*

Some Auto-AIRMAT Installations

ALICE MANUFACTURING COMPANY
Eljean Plant

RIVERDALE MILLS stops LINT

Foster Plant
AMAZON COTTON MILLS
BERKELEY MILLS
BURLINGTON INDUSTRIES
Batesburg Plant
Sydney Blumenthal Company
Cascade Weaving Plant
Franklinton Weave Plant
Love Plant
Martel-Henrietta Group
Mays Plant
Mooresville Mills
Peerless Woolen Mills
Tifton Plant
Piedmont Heights Plant
Ranlo Manufacturing Company
CLINTON COTTON MILLS
CLYDE FABRICS
CONSOLIDATED TRIMMINGS COMPANY
CROSS COTTON MILLS
DYERSBURG COTTON PRODUCTS
FEDERAL SPINNING COMPANY
GAFFNEY MANUFACTURING COMPANY
GREENWOOD MILLS
GROVES THREAD COMPANY
HABERSHAM MILLS
HIGHLAND COTTON MILLS
HOLT-WILLIAMSON COMPANY
JOHNSON MANUFACTURING COMPANY
JUDSON MILLS
LYDIA COTTON MILLS
MADISON THROWING COMPANY
MONARCH MILLS
Lockhart Plant
Monarch Plant
NATIONAL SPINNING COMPANY
NEW CAROLINA BLOUSE COMPANY
NEWS & COURIER
PACOLET MANUFACTURING COMPANY
Mill No. 4
Mill No. 5
Mill No. 6
PARKDALE MILLS
SPINNERS PROCESSING COMPANY
SPRINGS COTTON MILLS
J. P. STEVENS & COMPANY
Apalche Plant
Randleman Plant
Rosemary Plant
Seneca Plant
Tuxedo Plant
Utica Mohawk Plant
Victor Plant
Whitmire Plant
U. S. FIBER LABORATORY
Sirrine Hall
WISCASSETT MILLS

with AAF's Auto-AIRMAT lint filter

Airborne lint is the No. 1 enemy in many textile operations – but not at Riverdale Mills, Enoree, S. C. Here AAF Auto-AIRMAT filters remove lint fibers from the air as quickly as they are produced, *and automatically clean themselves at the same time.* These AAF filters now supply more than a half-million cfm of clean, lint-free air to Riverdale Mills' vital air-conditioning system.

Low-cost AIRMAT filtering media, installed in a continuous roll at the top, moves automatically down the face of the unit, collecting lint and dust all the way. And the Auto-AIRMAT wraps the collected material in a roll at the bottom of the filter for easy disposal. Maintenance: simply change rolls –as easy as changing film in a camera.

If you've got a lint problem, investigate the lint filter – AAF's Auto-AIRMAT. Call your local American Air Filter representative, or write direct for Bulletin 234. Address: Robert Moore, American Air Filter Company, Inc., 304 Central Avenue, Louisville, Kentucky. In Canada: American Air Filter of Canada, Ltd., 400 Stinson Blvd., Montreal 9, Quebec.

AAF American Air Filter
BETTER AIR IS OUR BUSINESS

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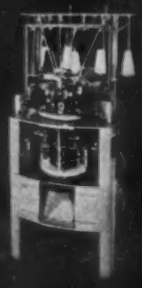
"READING" CK-A
for inlays, circular suturing, overplaids, and high-fashion socks with the continental look

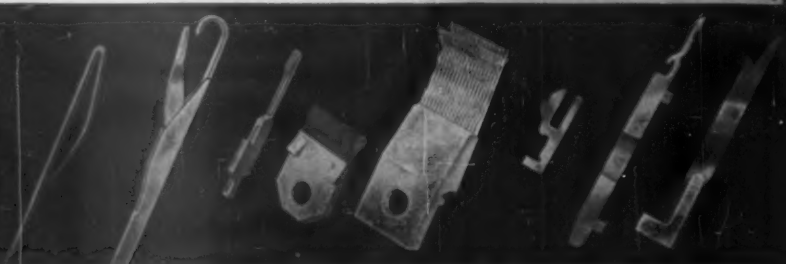
"READING" CK-B
for high production of plain dress and crew socks



"READING" CK-C
Universal men's and boys' sock machine

"READING-BOOTON"
Twin-Feed
Ladies' Seamless
Hosiery Machine

"READING" Mark III
Twin-Feed Lace
Machine for Ladies'
Seamless Hosiery



Spring-Beard Needles | Latch Needles | Precision Leaded Parts | Flat Parts for Full-Fashioned and Circular Knitting

"READING" Mark IV
Four-Feed Ladies'
Seamless
Hosiery Machine

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AT TEXTILE

Dependability

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Where profits are highest and maintenance cost lowest — you'll find "READING" equipment. All of the machines and parts illustrated here are proved in service for profitable knitting results. Don't be satisfied with anything less than the best. Buy "READING"!

TEXTILE MACHINE WORKS, READING, PA.

"READING" High-Speed Tricot Machine

"READING" Full-Fashioned Outerwear Machine

"READING 200" Full-Fashioned Hosiery Machine

TEXTILE MACHINE WORKS

Where engineering makes the difference

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Equipment and Supply News

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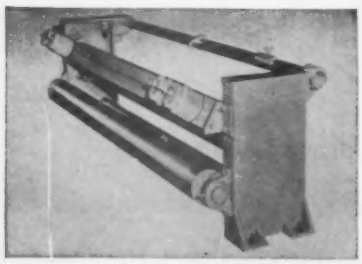
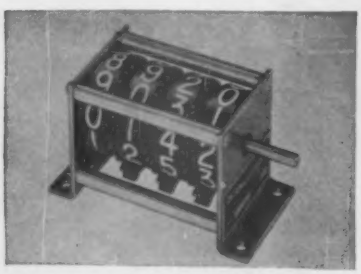
For more information on any of these items, write appropriate number on the Reader Service Card, next to the back cover.

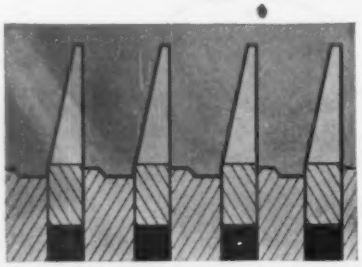
E-16—Proportioning valve actuator operates from 115 v., 50/60 cycles. It strokes 1-in. valves at line pressures to 1,000 psi. Stroke time is 4 seconds. Input can be a current- or voltage-regulated signal. Features: no gears or limit switches. G. W. Dahl Co., Inc.



E-17—Constant tension machine can be adapted to existing web processing or finishing equipment. It uses air supplied to two diaphragm cylinders on top of the frame. In turn these cylinders are linked to dancer or sensing rolls. The amount of air supplied to the cylinders sets the tension. You can adjust air supply through a regulator. A separate air supply controls the brake, which is plunger operated from a cam on the sensing roll. As the tension sensing roll moves down there is less braking. Stanford Engineering Co.

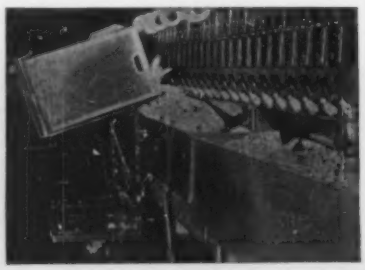


E-18—Counter, Model 3522, is reversible with large digits ($\frac{3}{4}$ inch high) on $7\frac{7}{16}$-in.-dia. drums. Drums and pinions are molded nylon, shafts are stainless steel mounted in a nickle-silver frame. Over-all size is $1\frac{1}{4}$x2x$3\frac{3}{16}$ inches. Haydon Instruments Co.



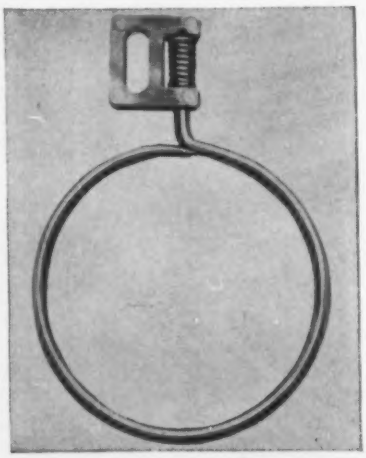
E-19—Reclothing process, for garnetts, prevents uncoiling as in groove-winding. The secret: a new wire caulking that locks in the garnett wire. Because the wire is wound on top of the cylinder, it lies flat, and its points are uniformly sharp. Caulking works with garnett wire sizes 6 through 18. Surface of the cylinder isn't destroyed, thus you can rewind more often. James Hunter Machine Co.

E-20—Dock bumper uses tread rubber reinforced with fabric for dock and truck protection. It comes in 12-, 24-, and 36-in. lengths. Each size is four inches thick and has a 3-in. metal reinforcing bar. Unit is mounted with ¾-in. anchor bolts. Kelly Co., Inc.



E-21—Hand truck has a spring-assist tilting mechanism to speed unloading. You need only one person to unload. This in-plant truck is "L" shaped with double-frame construction. Spring is attached to a horizontal pipe on top of the truck. A hydraulic plunger (bottom of inner frame) supports the frame during unloading. Truck has 4-in. steel plain-bearing casters. National Vulcanized Fibre Co.

E-22—Lift truck moves in four directions (forward, backward, left, and right) from a standing start. How? The wheels are hydraulically controlled and can be turned in any direction. It is a 4,000-lb. capacity truck. Power: 24-v. battery. Raymond Corp.

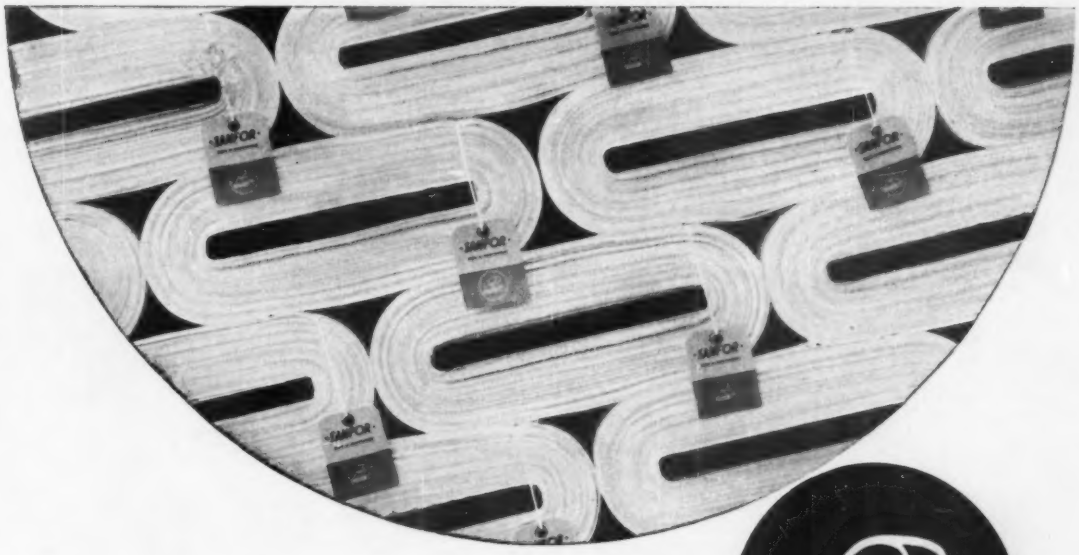


E-23—Balloon control ring saves time in twisting and spinning. With a flip of the ring you can reverse twist direction without realigning the ring. The spring-tensioned holder is aluminum alloy. Ring is electropolished stainless steel. Mitchell-Bissell Co.

E-24—Electric heater is explosion-proof type for automatic operation in hazardous atmospheres. It uses Chromlex brazed-fin heating element with low watt density. You install the heater by hanging it on wall-flange mountings. Edwin L. Wiegand Co.

E-25—Liquid graphite lubricant now comes in aerosol cans—6- or 16-oz. containers. It sprays graphite on hard-to-reach surfaces. The lubricant bonds to the surface to form a dry lubricating film. It's unaffected by high or low temperatures. American Resin Corp.

. . . *Turn to page 150*



OUR MACHINES HAVE PERFECTED OUR FABRICS

OUR FABRICS HAVE PERFECTED OUR MACHINES

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Equipment and Supply News

. . . *Begins on page 139*

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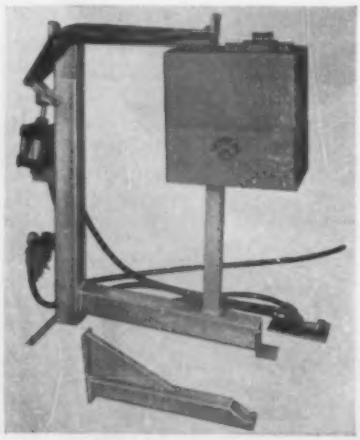
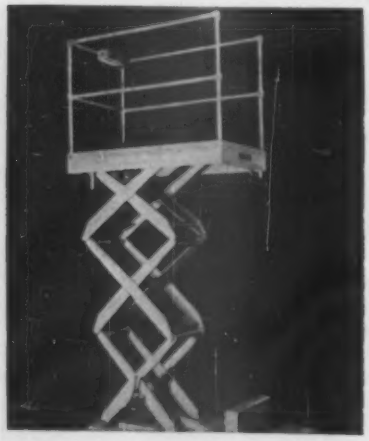
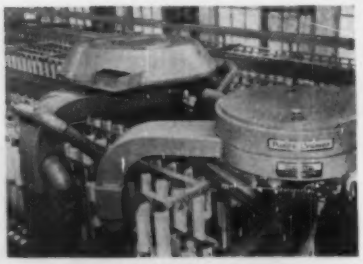


E-26—Box stapler, Model G-BA, closes the bottoms (or tops) of triple- or double-wall cartons. The unit uses a double-acting pneumatic piston for fast stapling. You can connect the stapler to any available 60- to 80-psi. air supply. Container Stapling Corp.



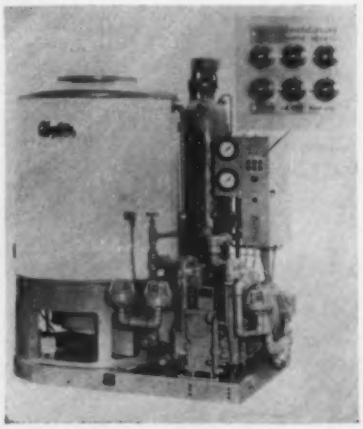
E-27—Personnel lift, for warehouse use, makes parts, storage, tool, and fixture selection easy. The self-contained lift has an extended 8-ft. platform. Pushbutton on the hand rail operates ascent, descent, and lateral movement. Capacity: 750 pounds. Collapsed platform height is 16 inches. Lift uses 220/440 v., 60-cycle, 3-phase power supplied by cord, reel, or bus bar. Southworth Machine Co.

E-28 — Packaging machine uses polyethylene shrinkable film, makes top and bottom closures or complete closures (third side also) as required. It handles items up to 16x16 inches. Operation is semiautomatic—the operator must start the machine. Sealing is by hot-knife cut-off. Operation speed is 40 cycles per minute. Unit handles textiles ranging from socks to garments. Doughboy Industries, Inc.



E-29—Overhead traveling cleaner, called FilterBlo, has an air-inlet filter to prevent lint from blowing on yarn during spinning. Result: better yarn. Cleaner uses lint-free air to blow the lint off spinning, twisting, roving, and winding frames. It's coupled with a traveling vacuum unit, because the cleaner has a large revolving filter that is continuously cleaned by the vacuum nozzle. Parks-Cramer Co.

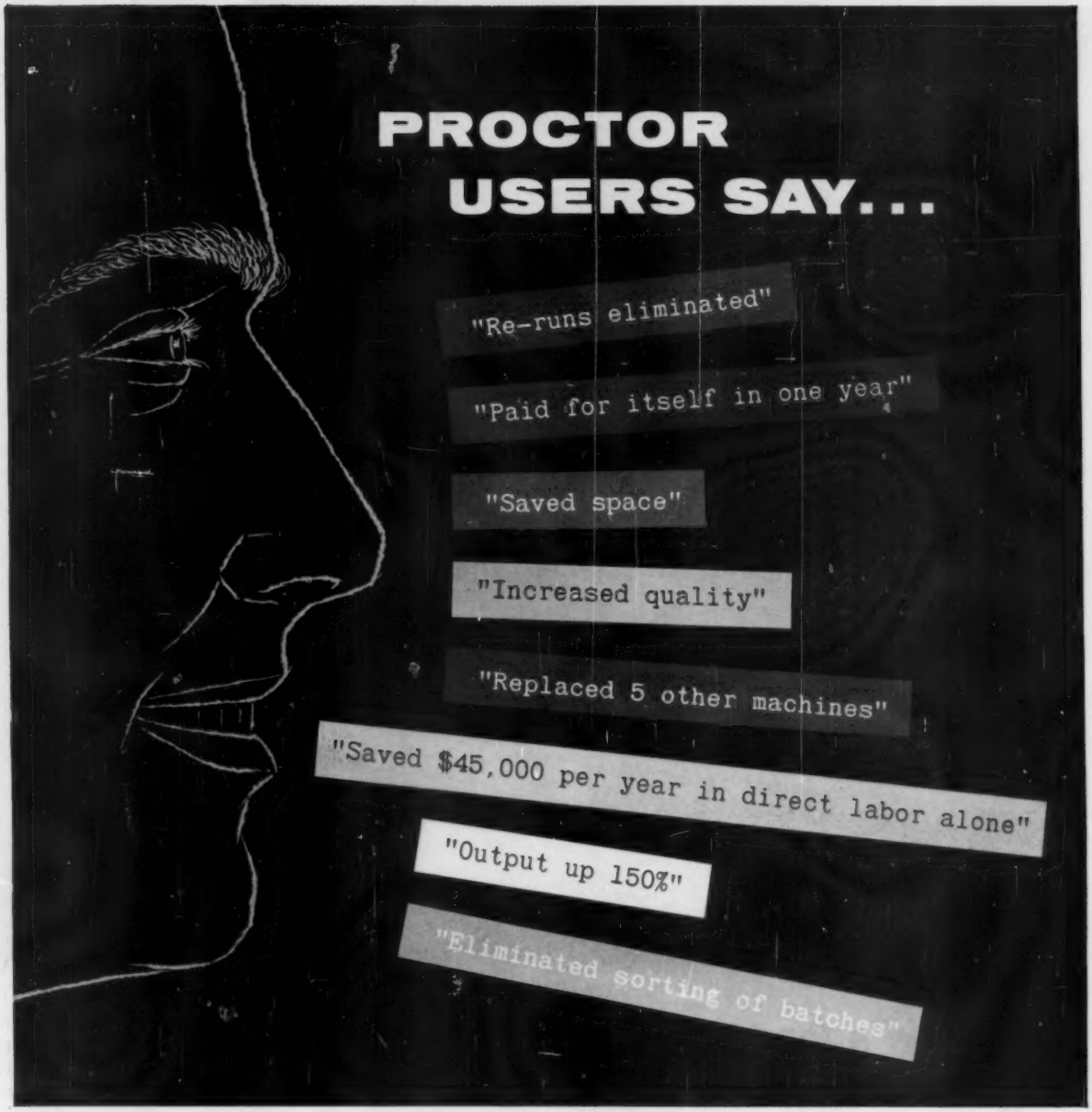
E-30—Treadle foot switch offers a variety of features for industrial use. It is available with one or two unit switches, each with normally closed or normally open contact. Also available is a treadle latch for on-the-job conversion from spring returns to maintained contacts. Other features are half-down or full-down treadle latches. Enclosures are NEMA 4 (watertight and oiltight) or NEMA 7 and 9 for locations where flammable gases, vapors, or combustible dust creates a hazardous environment. Three covers are available. Cutler-Hammer.



E-31—Steam generator is known as the "boiler with a brain" because it automatically indicates any cause of safety shutdown due to ignition failure, shortages of water, fuel, electricity, or combustion air. It delivers 5,000 to 6,000 pounds per hour at both low or high pressures. Another feature of the Model R-175 is an automatic oil level safety control. A new cooling system is in the pump heads. Clayton Mfg. Co.

E-32—Manual starter for fractional-horsepower motors has overload protection for both speeds on single phase two-speed motors. The rotating control knob is clearly marked—high, off, low, and reset. The 4-in.-sq. box comes in four-type mountings. Cutler-Hammer.

. . . *Turn to page 154*



modernize now with Proctor textile machinery

From fiber to fabric you'll find Proctor equipment increasing profits for its users through:

- **greater productivity**
- **higher quality**
- **less maintenance**
- **flexible operation**
- **more output with less labor**
- **longer life**

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AUTOMATIC BLENDING SYSTEMS • WEIGHING FEEDS • PICKERS • SHREDDERS • BALE BREAKERS • SYNTHETIC CARDS • GARNETTS • CONTINUOUS WEIGH BELTS • LOOP DRYERS & CURERS • ROLLER DRYERS & CURERS • LOOP AGERS FOR PRINT GOODS • TENTER HOUSINGS • TENTER FRAMES WITH INTEGRAL HOUSINGS • WEB FLOAT DRYERS • DRYERS FOR FIBROUS MATERIALS • CARPET DRYERS • YARN DRYERS • MULTI-PASS AIR-LAY DRYERS • NYLON SETTING EQUIPMENT • 2- & 3-ROLL PADDERS • OPEN-WIDTH BLEACH SYSTEMS FOR WOVEN FABRICS • CONTINUOUS BLEACH SYSTEMS FOR TUBULAR-KNIT FABRICS

PROCTOR & SCHWARTZ, INC.
PHILADELPHIA 20, PA.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 151

The world's longest range drive— at North Carolina Finishing— uses Westinghouse AVR Drives for maximum reliability

Adjustable Voltage Reactifier drives are perfect for the hot humid atmosphere of a textile mill—require less floor space and maintenance than conventional drives

J-96190

At the North Carolina Finishing Company, four Westinghouse AVR Reactifier drives power the world's longest textile finishing range. All four sections of the range are interlocked so they can be run independently or in tandem. Each section is driven by a synchronized shunt wound Westinghouse Lifeline* "H" d-c motor. Speed adjustments are made by armature voltage control.

Westinghouse AVR Reactifier drives use static devices to convert AC to DC. These reactifiers simplify installation, reduce maintenance and improve reliability.

Westinghouse Lifeline "H" Motors driving the range sections feature a ventilating system that moves more air, distributes it for most efficient cooling and clears machine parts of contaminating particles. Slim armature design reduces inertia. This combined with highly improved commutation produces faster motor responses and result in the most precise tension control. They are available in ratings from 1 to 500 hp.

Other Westinghouse products for the textile industry

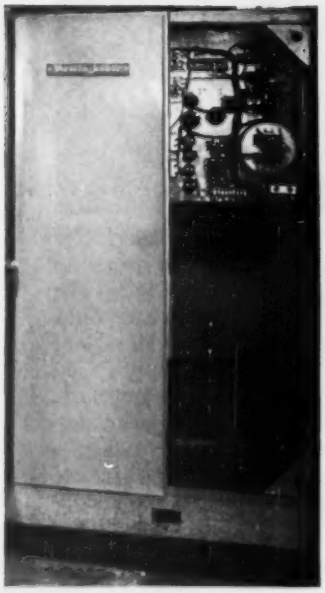
MODULINE* Gear Drives, either gearmotors or speed reducers, provide the best method of obtaining reduced speeds for all textile ranges. Easy gear changing means you can keep up with changing trends.

LIFELINE Starters for dependable motor control.

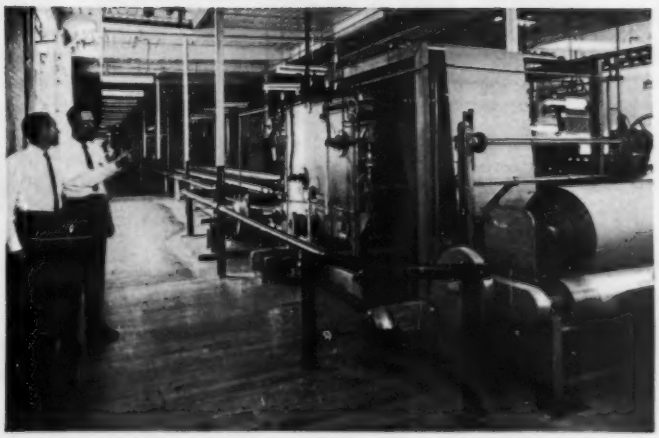
For details, contact your Westinghouse sales engineer or write: Westinghouse Electric Corporation, Box 868, Pittsburgh 30, Pa.

You can be sure . . . if it's Westinghouse.

*Trademark



Cabinet houses power supply for 100 hp AVR Reactifier Drive used in Section 4 of the finishing range. Color panel locates static power conversion unit.



Vernon Wilkerson (left), Plant Engineer at North Carolina Finishing Co., and Bert Wheeler, Westinghouse Sales Engineer, observe 400' long Section 4 of finishing range. AVR-40 controls width and speed of finished shirtings and dress goods.

Westinghouse

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 153

Equipment and Supply News

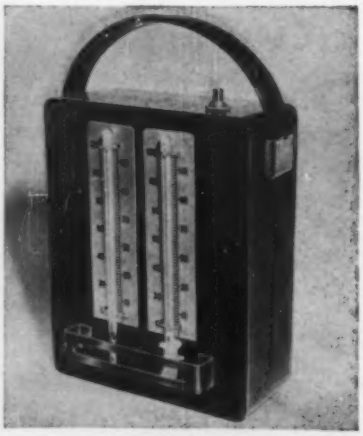
. . . *Begins on page 139*

For more information on any of these items, write appropriate number on the Reader Service Card, next to the back cover.

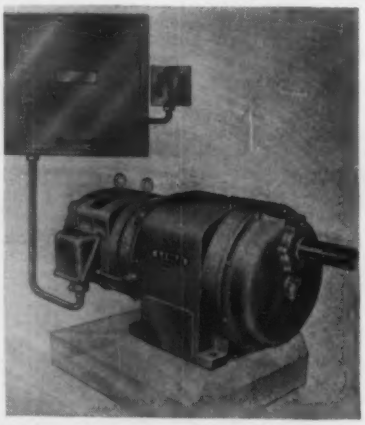
E-33—Laboratory jig features constant cloth speed for each batch diameter. But you can adjust this speed from 0.3 to 3 meters per minute. It has a pass-counting device that can be preset up to 35 passes. And you can adjust cloth length per pass from 0.5 to 10 meters. Temperature regulation ranges to 100 C. Trough capacity: 600 cubic centimeters. Benteler-Werke Aktiengesellschaft.

E-34—Photoelectric impulse control and scanner detect register marks in high-speed control application. Called Type 23DF3, the control is fully transistorized and operates on small abrupt changes in light reaching the cell. The scanner, Type 42RA1, is slightly larger than a cigarette lighter. It's constructed for long life. The unit works on either light increase or decrease. Electronics Corp. of America.

E-35—Winding drive controls tension at low cost. And its performance approaches electronic drives. It uses viscous shear and hydrokinetic principles that automatically increase torque as speed is reduced. The drive handles roll build-up ratios of 8 to 1 and a speed range of 3 to 1. There are only two adjustment controls. Feedlock control or edge guides are available. Fluid Drive Engineering Co.

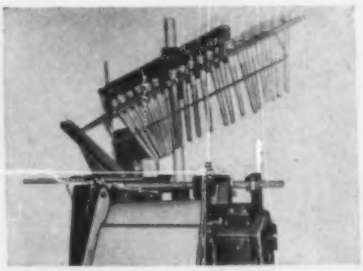


E-36—Psychrometer, portable type, uses two flashlight batteries to drive the fan that evaporates water from the wet bulb thermometer. Moisture wicks to the wet bulb from a water reservoir. A relative-humidity conversion chart is attached to the back of the unit. The case, made from phenolic resin, has a carrying strap. This compact unit weighs 1½ pounds. Better Fabric Testing Bureau, Inc.



E-37—Shift drive uses pushbutton-controlled hydraulic clutches to shift to any of six speeds. You can shift while running at full load. It delivers full horsepower at the output shaft. Capacities: 20, 25, 30, and 40 horsepower. Lima Electric Motor Co., Inc.

E-38—Air-release valve, No. 69, vents air from hot or chilled water systems at low initial cost. It eliminates air or gases from lines in applications up to 100 psi. Body is cast iron; valve, seat, and float are stainless steel. You install the valve at the high point of the system. As air accumulates, the valve automatically and continuously releases it. Unit works on any pipe line. V. D. Anderson Co.

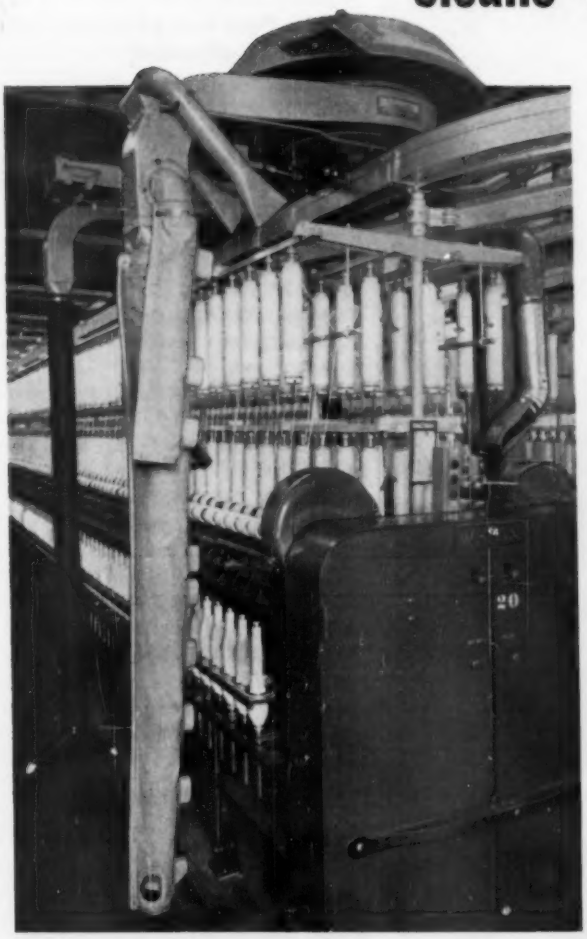


E-39—Bobbin tester checks trueness of filling bobbins and rejects those that exceed a preset level. It operates at 37 bobbins per minute on 115 v. a.c. This machine takes up little space (28x28x29 inches) and weighs 300 pounds. Steel Heddle Mfg. Co.

E-40—Variable-speed drive, for Lightnin mixers, controls speeds up to a maximum ratio of 5 to 1. The unit uses adjustable-diameter disks and a ribbed belt. You can replace the belt on the job quickly and easily. A hand crank operates the speed-setting dial. For remote control the compact unit comes with a tachometer for use at the remote speed-control station. Mixing Equipment Co.

. . . *Turn to page 158*

Parks-Cramer FilterBlo cleans with filtered, lint-free air



In spinning yarn under the cotton system, the need to capture as much lint as possible, as quickly as possible, is well known to mill men.

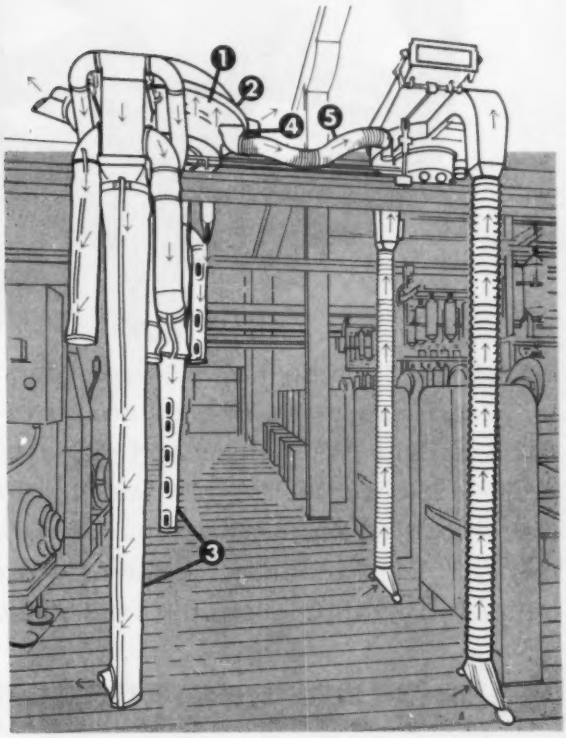
Conventional blowing cleaners do their work with lint-laden air. Lint blown into yarn in process is a cause of slubs, choked trumpets, traveler loading, ends down and yarn imperfections.

Parks-Cramer FilterBlo greatly reduces these troubles by filtering all air as it enters the traveling blower unit. Its filtering action appreciably cuts down the lint content of room air.

Recent controlled mill tests of Parks-Cramer's new FilterBlo disclose data we believe many of our mill friends will want to investigate.

Some examples:

Ends down	24% less
Clearer waste	8% less
Major yarn imperfections	16% less
Yarn breakage in cone winding	35% less



Room air enters FilterBlo through perforated, teflon-coated, stainless steel filter plate (1), located on bottom of rotating assembly. Revolving Up-draft blower (2) sweeps ceiling and overhead surfaces with diagonal air currents. Flexible sleeves with multi-outlets (3) are engineered to fulfill exact cleaning requirements. Air inlet filter is cleaned (4) continuously through connecting vacuum sleeve (5) coupled to TravelVac of either the Long Storage or automatic unloading type.

FilterBlo

...major advance in Traveling Cleaners

Parks-Cramer Company

FITCHBURG/MASS. CHARLOTTE/N. C. ATLANTA/GA.

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 155

(Advertisement)

Dependability is built into Draper looms . . . part by part. Regardless of size, shape or location, each part is engineered and manufactured to precise tolerances. The Harness Cam Assembly illustrated above, is one reason why Draper has become the accepted name for quality and dependability throughout the textile industry.

DRAPER CORPORATION

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N. C. • SPARTANBURG, S. C.

RETARDING LOOM OBSOLESCENCE

A steady flow of new Improved Repair Parts keeps mill weaving machinery up-to-date

Draper Corporation is continually improving parts and mechanisms for its looms. Year after year, scarcely a week passes without the introduction of another Improved Repair Part for one or more Draper loom models. These are all designed by Draper research and engineering staffs to keep present mill machinery competitive with our newest looms.

Each Draper Improved Repair Part is made for application to as many mill loom conditions as possible. Although they may be copied by others, the original design of these parts can be successfully accomplished only by the loom builder, for he alone has complete information on the various loom constructions in the field.

These Improved Repair Parts help to keep older looms operating profitably. They postpone the day when a mill must consider its looms to be obsolete.

What is an Improved Repair Part? An Improved Repair Part is one so developed by Draper engineers that is can be applied, as far as possible, to all existing Draper looms in the mills. It is designed to give one or more of the following benefits:

1. Better service throughout a longer life than the original loom part.
2. Easier installation with less down time.
3. Better loom operation.
4. Production of higher quality fabrics.

How Improved Repair Parts are developed. Ideas for Improved Repair Parts originate from Draper engineering and manufacturing de-

partments, Construction Committee members, Draper sales and service men, recommendations of material suppliers and, frequently, from suggestions by mill superintendents, overseers, and loom fixers.

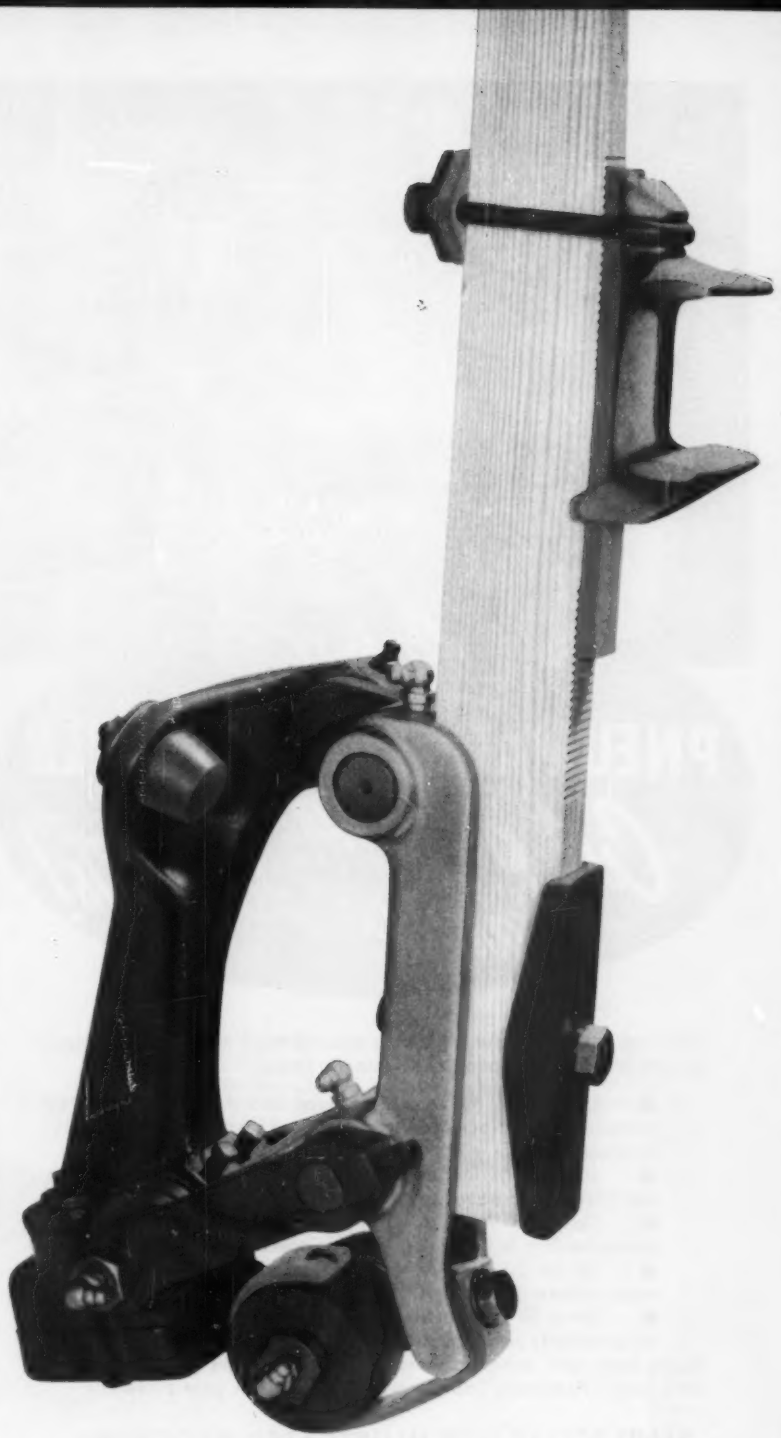
Usually extensive "mill trials" are conducted, whereby a new part proves itself in actual weaveroom operation, before it is offered for sale.

Although Improved Repair Parts are designed to replace older parts, mills often use both old parts and new Improved Repair Parts simply because supply room bins and records are set up for ordering both. Generally the older number could be eliminated to advantage.

Why Draper Parts are best for Draper looms. Uniformity of parts is necessary for successful standardization in setting loom mechanisms to gauge. Worn or poorly fitting parts just cannot be set to gauge. Competitive mills know that only with the best loom parts available can they get uniform and accurate settings, that *only with gauged settings can they get maximum production, lowest weaving costs and highest cloth quality.* These mills are first putting their looms in top condition and then running them with correct and standardized settings.

In such a planned program, differences in initial cost of repair parts are often found to be of least importance. More and more mills are using Draper parts *exclusively* to maintain their weaving machinery at highest competitive standards. Draper parts are made from the same metal mixes as original parts furnished with the loom. They are finished to master overall gauge dimensions available only to the loom manufacturer. Draper Improved Repair Parts fit Draper looms and each other better; as a result, they are dependable and last longer. Correct engineering design, selection of proper materials and use of economical manufacturing methods are determined for each Draper part by a competent knowledge of their effect upon *total loom operation.*

You can find out more about Improved Repair Parts from your Draper Improved Repair Parts Catalog, from Draper sales and service representatives, or by writing to Draper Corporation.



Draper Link Type Parallel . . . provides a positive fully constrained action, contributing to smoother shuttle flight, improved boxing, simplified adjustment and longer life of Shuttle Box and Pick Motion parts.

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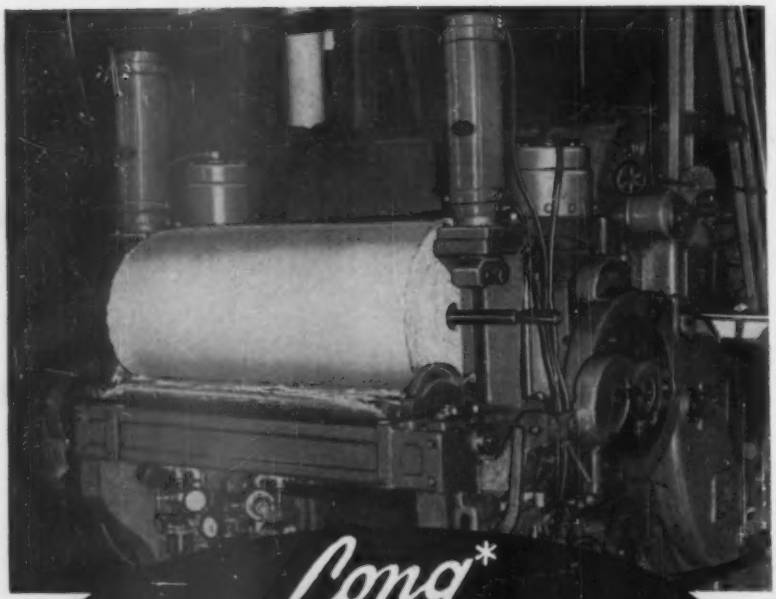
HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N. C. • SPARTANBURG, S. C.



Long*
PNEUMATIC LAP CONTROLS
Cut picking and carding costs!

Take advantage of these savings with LONG* lap control systems for pickers, for both cotton and synthetic fibers:

- Up to 50% increase in yardage and weight of lap without increase in lap diameter (laps of 75 to 85 pounds, 18" to 19½" in diameter.)
- Up to 50% longer lap runs between doffs at pickers, giving increased production per picker.
- Up to 50% longer lap runs between lay-ins at cards, giving savings in labor costs for this operation.
- Up to 50% fewer piecings of laps behind cards, and more uniform card sliver.
- Up to 50% reduction in return waste from cards to pickers, automatically saving money.

Figure your own potential savings and you'll see that you should have Long* Pneumatic Lap Control equipment for your pickers.

SEND TODAY FOR ILLUSTRATED BROCHURE

* U. S. Patent No. 2,871,519. British Patent No. 850,694. Other U. S. and foreign patents pending.

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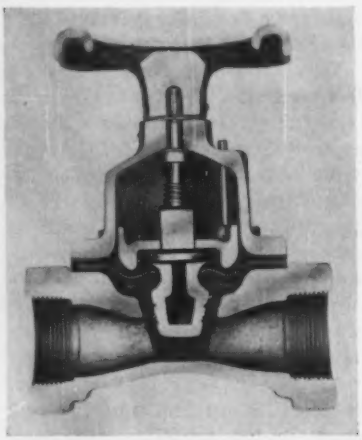
Equipment & Supply News

. . . *Begins on page 139*

For more information on any of these items, write the appropriate number on the Reader Service Card, next to the back cover.

E-41—Epoxy surfacing compound is well suited for patching concrete, wooden, or steel floors, walls or tanks. It can be feather-edged. When you apply compound No. 6713, ⅛ to ¼ inch thick, it equals the strength of 2 inches of concrete. Dennis Chemical Co., Inc.

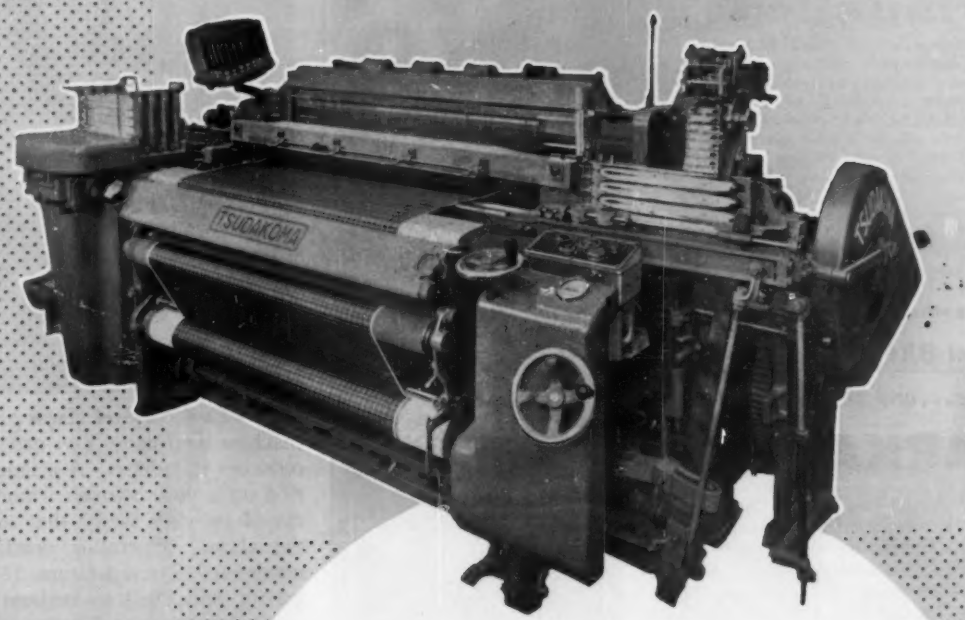


E-42 — Straight-flow diaphragm valve combines versatility of diaphragm valves with flow capacity of gate valves. Called Dia-Plug, the valve handles gases, fluids, vacuums, and slurries at up to 180 F. at 150 psig. Rubber and fabric diaphragms are molded to a wedge plug that fits into the semiventuri body. It throttles or completely closes as desired. You can replace the diaphragm without removing the valve from the line. Valve sizes range from ⅜ to 8 inches in various metals or special liners as required. Cryogenics Corp.

E-43—Scorch tester uses closely controlled conditions of temperature and pressure to insure reproducibility of results. It determines damage due to retained chlorine, colorfastness of wet or dry pressing, color transfer due to heat or pressure, and property changes due to pressing. The unit uses 150 or 220 volts. Temperature control ranges from 250 to 440 F. Atlas Electric Devices Co.

. . . *Turn to page 160*

Tsudakoma



ツダコマ

Automatic Loom and Ordinary Loom

(for Silk, Rayon, Nylon and all Synthetic Yarns)

Dobby

Preparatory Machine

Throwing Machine
High Speed Bobbin Winder
Doubling Machine
High Speed Bottle Winder
High Speed Warping Slasher
High Speed Sectional Warper
High Speed Magazine Creel

TSUDAKOMA INDUSTRIAL CO., LTD.

Head Office : Kanazawa, Japan
Branch Office : Tokyo • Osaka

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 159

Routine cleaning with a V-Mop keeps Urethane Finish looking new even after months of heavy traffic.

New Tennant URETHANE Floor Finish: easy to clean, economical to use... and beautiful. But even more exciting is its

REMARKABLE DURABILITY!

The beautiful floors you see in the pictures were not newly refinished for picture-taking purposes. When the photos were snapped, this finish was already *six months old.*

What is it? TENNANT 120 Urethane, the remarkable new Textile Floor Finish that will last at least 2.4 times longer than other types of urethane finishes. *It can well outlast your present finish by as much as 6 to 1.*

Ideal for heavy-traffic areas. Even more fantastic is its durability in "problem" areas. It resists all usual mill oils and starches. Harsh acids fail to mar or discolor its gloss finish. Even under constant trucking its clear tough film is almost "traffic-proof."

Most economical—by far. In terms of long life, easy maintenance and attractive appearance, new TENNANT Urethane is far more economical in the long run, we believe, *than any other textile floor finish now available.*

This is a strong statement. Make us prove it on what *you* consider your toughest traffic area—be it spinning room, weave room, cardroom, or in your busiest aisle.

WRITE to G. H. TENNANT Co., 737P N. Lilac Drive, Minneapolis 22, Minn. Your TENNANT Man will supervise a test application.

Oil-free, high-gloss and colorless, new Tennant Urethane does not darken with age . . . preserves the natural beauty of wood with a tough, easy-to-clean surface.

TENNANT

The Textile Industry's Most Widely Used

METHODS MACHINES MATERIALS

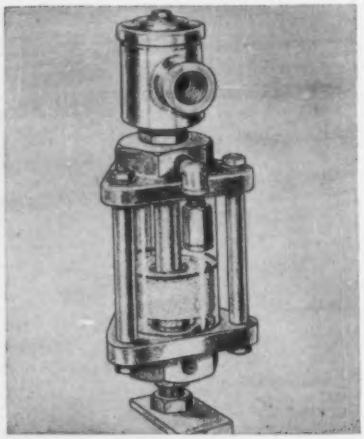
FLOOR MAINTENANCE SYSTEMS

Scientifically Planned and Adapted to fit YOUR NEEDS

Equipment & Supply News

. . . *Begins on page 139*

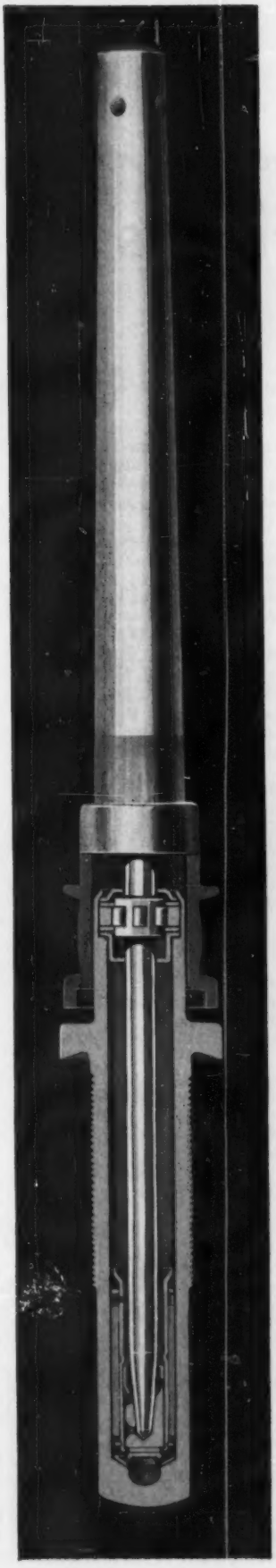
For more information on any of these items, write the appropriate number on the Reader Service Card, next to the back cover.



E-44—Low oil-level alarm protects machine bearings. You can use it outdoors or indoors. A magnet carried on a float actuates a normally closed mercury switch that sets off the alarm. Operating conditions: maximum oil temperature 185 F., gravity flow, light-to-medium oils, single-pole switch—1 amp., 120 v. a.c. or ½ amp., 120 v. d.c. Body is aluminum alloy, reservoir is Lucite. Oil-Rite Corp.

E-45 — Counter-measure machine shows operating time in minutes and tenths. The unit, Model R-400-3, works on spinning frames. It has a manual reset for each dial. Model L-555 is used for looms, and separately counts warp, filling, and other stops. Richards Associates.

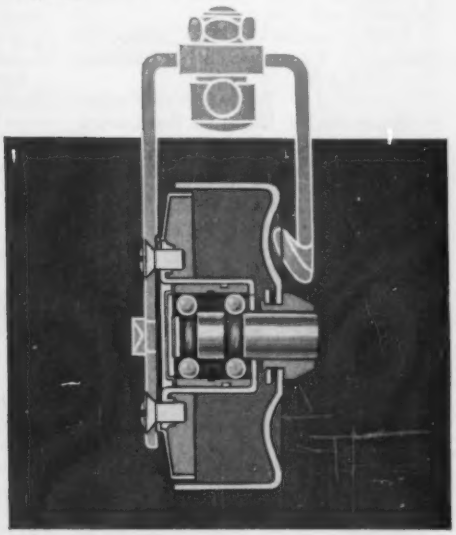
Center-Spindle SB



Süssen

Kugellagerwerk

Suessen-WST Center-Spindles combine two significant advantages—an outstanding damping capacity and excellent centring properties. They do not tend to vibrate when passing the critical zone of resonance (1000 to 3000 rpm) and run in the exact middle of the ring at working speeds. In addition, the oil reservoir being very large, the oil does not have to be changed for long periods at a time. All the parts are of extremely robust construction, which makes the Suessen-WST Center-Spindle a very durable component. Thanks to its increased damping capacity, the SX spindle can stand up to very high working speeds.



The Suessen-WST tensioning pulley shown here is a remarkable construction, serving to guide the tape of the spindle drive on ring spinning and ring doubling frames. Its particular advantages are: robust design, low power consumption, thanks to the precision ball bearings, and simplified lubrication, which is necessary only after long intervals, and for which a grease nipple has been provided on the surface of the bearing.

SPINDELFABRIK SUESSEN/
SCHURR, STAHLECKER & GRILL/GmbH
SUESSEN/WUERTT., GERMANY

Center-Spindle SX

FOR MORE DATA REFER TO READER SERVICE CARD—ADV. NO. 161

References that will help you in . . .

Identifying Fibers

. . . *Article on page 47*

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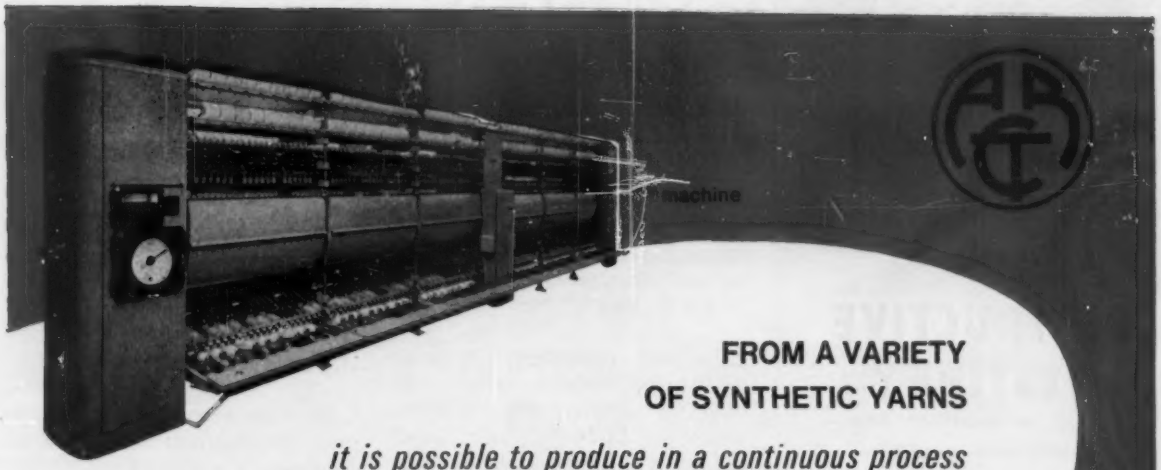

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it is possible to produce in a continuous process

BULKED YARNS WITH CONTROLLED STRETCH

with the highest possible covering power and high dyeing regularity for

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with the **FTF MACHINE**

This machine is based on the same principles as the MODEL FT MACHINE for bulked yarns with high stretch. It has similar basic elements but incorporates the following improvements :

(A) automatic yarn cutters on single ends, thus reducing supervision of the machine

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(C) large take-up capacity on :
tubes for direct use
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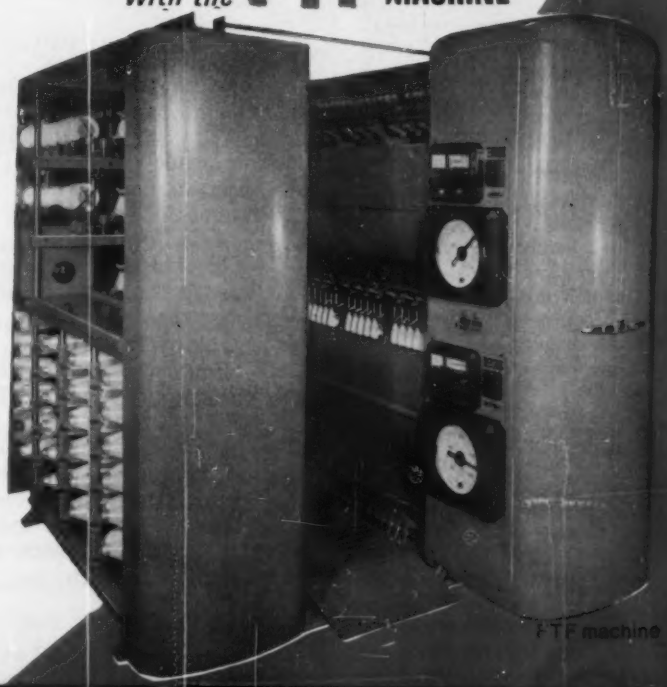
The equipements listed under **A** and **B** can also be supplied for the FT machine



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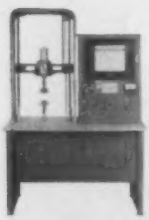

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TEXTILE WORLD . . . New Literature

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TEXTILE MACHINERY & AUXILIARY EQUIPMENT

L-1—Infrared ovens. Catalog BRG-115 lists 540 vertical and 144 horizontal models. Includes price for each model with controls. Photos and diagrams illustrate text in 16 pages. Radcor, Inc.

L-2—Tow converters. Bulletins describe in Spanish methods for changing synthetic tow to sliver. Brochures M-3650 (single head) and M-3680 (dual) cover drawing frames. Warner & Swasey Co.

L-3—Disk brake. Detailed diagrams of standard and dust-tight waterproof enclosure are in Bulletin N. P. P. 3-61-B. Includes a chart of inrushing and holding currents. Stearns Electric Corp.

CHEMICALS & SUPPLIES

L-4—Anhydride. Its physical, chemical, and physiological properties are detailed in 40-p. booklet. Includes textile applications. Charts and diagrams illustrate text. General Aniline & Film Corp.

L-5—Chemicals. Chart describes and lists applications for over 50 chemicals. Fold-out pages make reading easy. Includes fine, synthetic resin, and organic chemicals. Heyden Newport Chemical Corp.

L-6—Chemicals. Bulletin P-104 contains information on over 70 chemicals. Charts outline properties in 6 pages. Text covers specialty products and shipping data. Eastman Chemical Products, Inc.

ENGINEERING

L-7—Oil heaters. Text discusses design, construction, and advantages of heaters. Bulletin 1416 lists capacities and dimensions of 2 types. Photos show models. Griscom-Russell Co.

L-8—Bearings. Bulletin 7104 includes a photo and short description of each type. Lists a load rating table and dimensional charts. Three-hole punched. T. B. Wood's Sons Co.

L-9—Air heating. Labeled diagrams show a typical system and typical layouts in Bulletin AS-62. Includes many application photos. Describes different types of systems. Maxon Premix Burner Co.

L-10—Gate valves. Charts list material specifications and valve dimensions. Circular 637 includes labeled diagrams and photos. Test pressures are listed in 2 pages. Lunkenheimer Co.

L-11—Glass insulation. In 20 pages Catalog FB-108 describes and illustrates many uses. Covers accessory materials. Charts outline physical properties and heat transmission values. Pittsburgh Corning Corp.

L-12—Pressure hose. Its features and applications are explained in Bulletin 15-E. Includes specifications, working pressure correction factors, and assemblies. Atlantic Metal Hose Co., Inc.

L-13—Precipitator. Fifteen models are listed in a dimensional chart. Its design, operation, and construction are discussed in 6-p. folder. Contains specification data. Permutit Co.

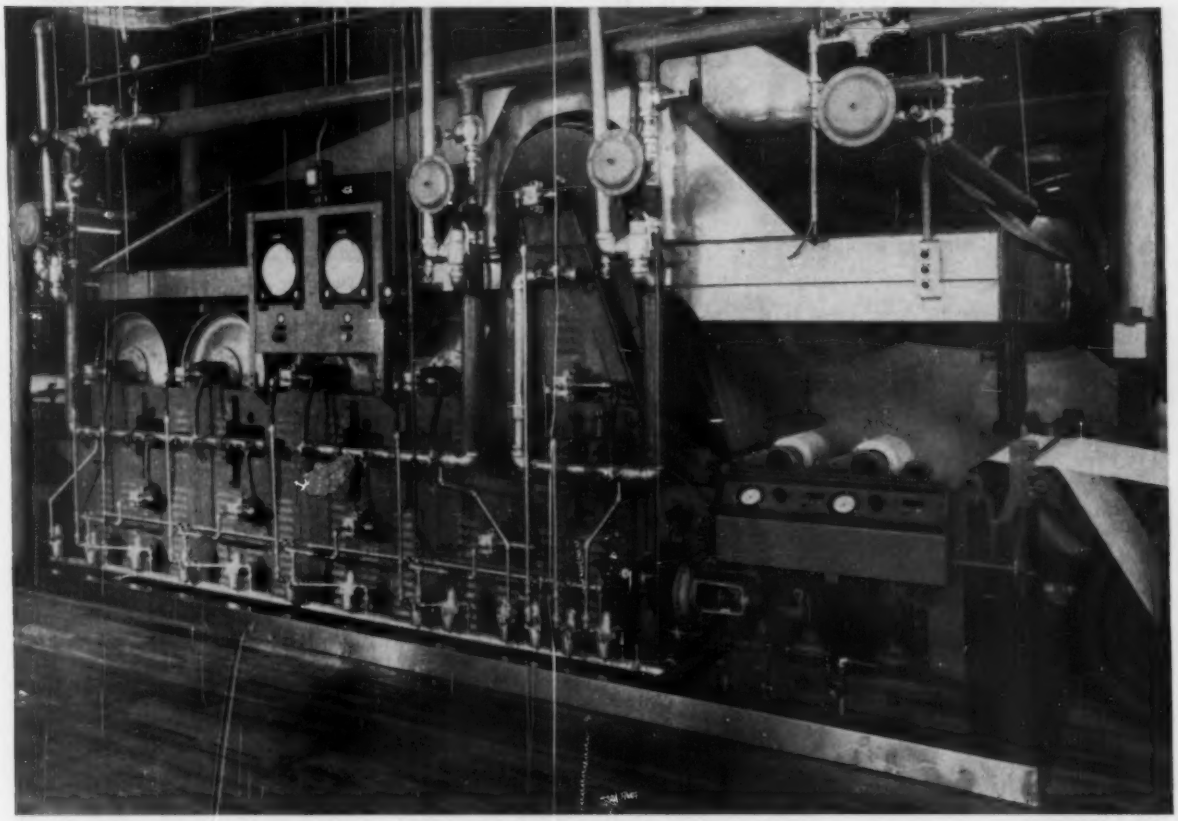
INSTRUMENTS & TESTERS

L-14—Recorder. Technical Bulletin 113 contains a description and operational characteristics. Easy-to-read charts list specifications. Photos included. Panellit Division, Information Systems, Inc.

L-15—Instruments. Thirteen sections provide comprehensive treatment of many process instruments. Catalog G-1a gives other references for detailed information. Minneapolis-Honeywell Regulator Co.

L-16—Temperature controller. Dia-

ANOTHER RECENT COCKER GH SLASHER INSTALLATION



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Extra convenience is another valuable advantage. Any cylinder can be removed individually. Snap-out venting panels and light metal sprocket guards can easily be removed by one man. Low silhouette permits watching the warp on standard top cans without using a platform.

Now and for years to come, no other machine will be more capable of heavy, high-speed production loads for all types of fibers — truly "TOMORROW'S SLASHING TODAY". Write for illustrated catalog.

A Few of the Other Superior Cocker Features are...

- **Direct Torque Tube Beam Drive* which prevents stretching and eliminates troublesome belts, chains, sprockets, etc.**
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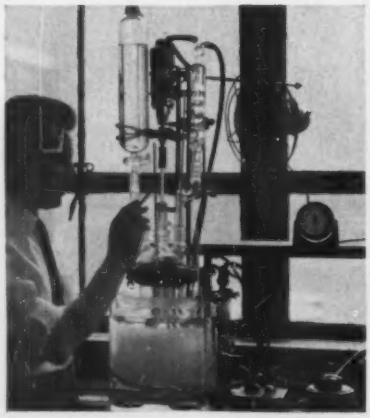
Rezosol acrylic copolymer size solves filament polyester weaving problems.

Outstanding weaving performance has been proven, both in the lab and under actual mill conditions by Rezosol, a recently developed size for filament polyester yarns. It is an anionic acrylic copolymer depositing a clear, tough, flexible film with superior bonding properties. Because of this, it is possible to get maximum first quality goods and top weaving efficiency even with yarns having a twist of only 5 to 7 turns per inch.



Rezosol is readily removed by conventional desizing and scouring procedures.

Size Formulas

By varying the concentration of Rezosol in the size bath, varying twists of yarn can be handled with equal efficiency. For yarns with 5 to 7 turns per inch, the bath should contain about 8% solids; at 12 to 15 turns about 5%; and at 17 to 20 turns only 2.5% solids are required.

The size solution is easily prepared by heating the water to 170°F and adding soda ash and the Rezosol. The bath should be held at this temperature and thoroughly agitated for 5 to 10 minutes before use. The finished size is applied at 160°F.

It is recommended that the warp be overwaxed with Houghto-Wax 5010 for maximum weaving efficiency.

Get Data Sheet

For complete information on Rezosol, write for data sheet which fully describes the product, how to prepare the size solution and provides suggested slasher operating conditions. E. F. Houghton & Co., 303 W. Lehigh Ave., Phila. 33, Pa.

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NEW LITERATURE

. . . *Begins on page 164*

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grams point out operation for heating, cooling, vacuum, and level control. Its features and accessories are listed in Bulletin 850. Brooks Instrument Co., Inc.

L-17—Recording receiver. Its construction, design, size, and capabilities are evaluated in Product Data Sheet A113.3.3-2. Photos, charts, and engineering drawings supplement text in 7 pages. Bristol Co.

L-18—Meter-relays. Many models are depicted in 24 pages. Charts show standard circuits. Bulletin 5 includes operating features and specifications. All prices listed. Assembly Products, Inc.

L-19 — Recorders. They're described in terms of accuracy for selection purposes. A specification form is in Bulletin GEA-6933A. Includes data on applications and accessories. General Electric Co.

L-20—Data loggers. Their log sheets are illustrated. Bulletin D 401 explains functions, data collection, design, cost, and maintenance. Photos show typical applications. Bristol Co.

ELECTRICAL

L-21—Ultraviolet energy. Booklet LS-141 explains sources in 12 pages. Discusses design procedures and applications. Lists suppliers of equipment and fluorescent materials. General Electric Co.

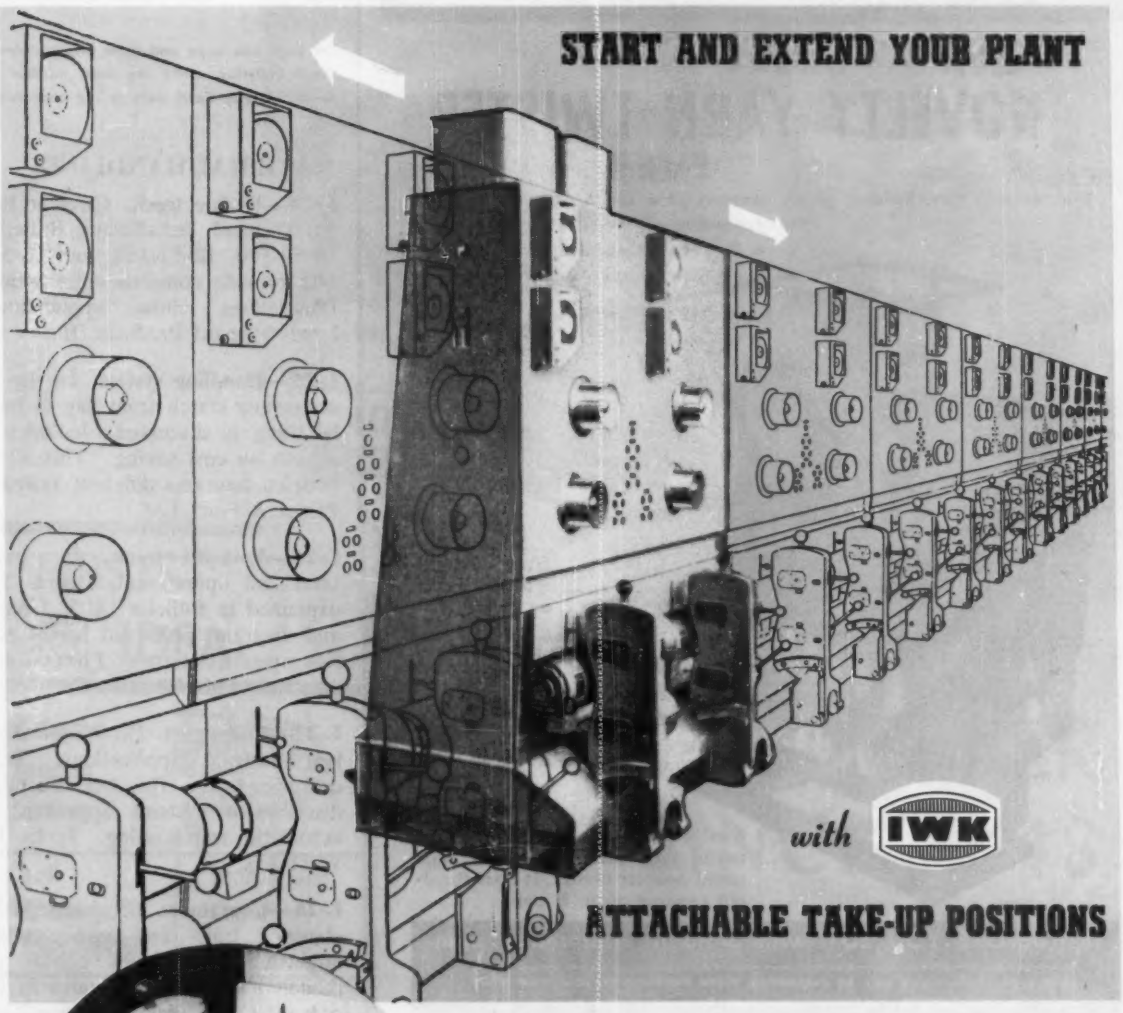
L-22—Switchgear. Drawings, sketches, and photos provide comprehensive information in Bulletin 2800-2B. Includes a detailed specification guide in 40 pages. I-T-E Circuit Breaker Co.

L-23—Power packs. Uses for electrostatic equipment are evaluated. Cutaway drawing shows construction. Dimensions and electrical characteristics included in Bulletin GEA-7328. General Electric Co.

. . . *Turn to page 168*

Synthetic Fibre Production

START AND EXTEND YOUR PLANT



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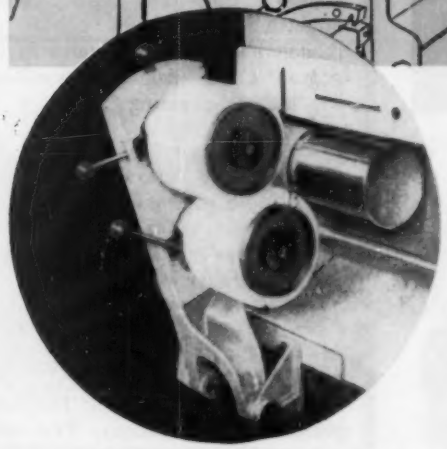

Tandem arrangement of bobbins for doubling the production.

Optional extension of the machine to the left or to the right by attaching further take-up positions.

Space-saving design. The main drive is separate from the machine, with the whole range of spinning heads being available for the take-up positions.

Individual stopping of each thread. Friction roller, traverse and godet wheels of each take-up position are driven by individual motors.

High traverse speed for extreme thread speed with smoothly operating machine.

Take-up positions available also in double-sided design according to the arrangement of spinning heads.

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Dual feature—this machine not only twists yarn but serves as a high speed doubler twister. It does standard twisting up to 8 ends.

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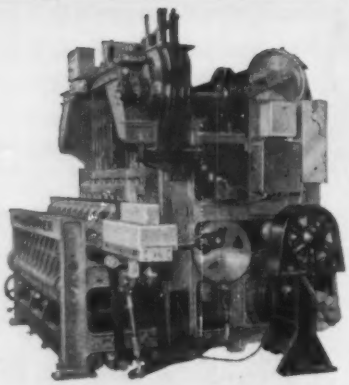

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NEW LITERATURE

. . . *Begins on page 164*

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MATERIAL HANDLING

L-24—Walkie truck. Circular PC-52-100 and Installation Bulletins IB-52-100, IB-52-101, and IB-52-102 provide complete information. Illustrations show applications. Lewis-Shepard Products, Inc.

L-25—Handling system. Its use in converting starch from bag to bulk handling is discussed. Includes a section on cost saving. This 12-p. booklet diagrams different systems. Penick & Ford, Ltd.

L-26—Fork-lift truck. Its structural and operational features are explained in Bulletin 1405. Charts and diagrams point out height and lift specifications. Three-hole punched. Otis Elevator Co.

L-27—Conveyors. On-the-job photos illustrate applications. Text describes types. This 4-p. brochure discusses a systems approach to automatic warehousing. Jervis B. Webb Co.

L-28—Containers. Brochure C-101 shows 8 time- and money-saving applications. Includes photos of models and optional features in 12 pages. Chart lists specifications. Tri-State Engineering Co.

L-29—Storage. Many types of equipment are described and illustrated in 48 pages. Catalog 720 includes a section on planning. Lists specifications and applications. Frick-Gallagher Mfg. Co.

L-30—Strapping machines. Standard and optional components of 2 models are listed in Folder AD-406. Photos illustrate operation. Diagram points out specifications. Text discusses advantages. Acme Steel Co.

L-31—Conveyors. Fifteen photos and captions make up this 4-p. brochure. Includes cost-cutting ideas. Many industrial applications are covered. A new roller is introduced. Standard Conveyor Co.

. . . *Turn to page 170*

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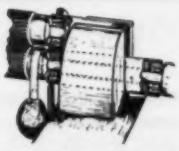

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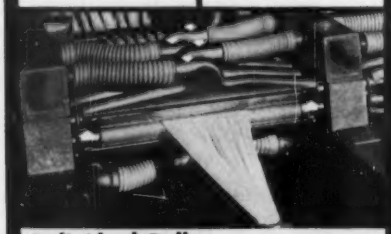

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NEW LITERATURE

. . . *Begins on page 164*

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MOTORS & DRIVES

L-32—D.C. drives. Bulletin 112 describes their operation in 2 pages. Includes a schematic layout of drives. Chart lists specifications. Text outlines textile applications. Louis Allis Co.

L-33—Speed changers. Cutaway drawing shows parts in 2-p. folder. Briefly lists accessories. Text outlines advantages. Control operations are pictured and described. Allis-Chalmers.

L-34—Reluctance motors. Their design, construction, and installation are discussed in Bulletin GEA-7332. Cutaway photo shows internal components. Diagrams show dimensions. General Electric Co.

PUMPS

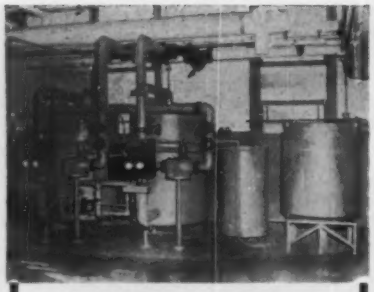
L-35 — Electrohydraulic pumps. Functions and applications are explained in Bulletin 47740. Photos illustrate models. Diagrams show control systems. System components are described. Oilgear Co.

L-36—Pumps and motors. Curves of typical performance characteristics are included in 2 pages. Text covers description, features, control options, and applications in Bulletin 61-81. Vickers Inc.

L-37—Proportioning pumps. Their arrangement of gears is described. Bulletin 861 includes capacity and selection tables. Cutaway drawings and photos illustrate text. Jaeco Pump Co.

L-38—Gear pumps. Their design is discussed in 2 pages. Contains data on drives. Charts and diagrams give capacities and dimensions in Bulletin GC1261. Three-hole punched. Eco Engineering Co.

L-39—Centrifugal pumps. Charts outline parts and construction materials of pumps. Drawing gives a sectional view. Performance curves are shown in Bulletin 722.6. Goulds Pumps, Inc.



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TEXTILE WORLD . . .

Calendar

December

AATT, New York Section, monthly meeting, Della Robbia Room, Hotel Manger-Vanderbilt, New York, Dec. 6

National Association of Manufacturers, Annual Congress of American Industry meeting, Waldorf-Astoria Hotel, New York, Dec. 6 to 8

AATCC, Northern New England Section, Motel 128, Dedham, Mass., Dec. 18

1962
January

AATT, New York Section, monthly meeting, Della Robbia Room, Hotel Manger-Vanderbilt, New York, Jan. 3

National Cotton Council, Cotton Research Clinic, The Carolina Hotel, Pinehurst, N. C., Jan. 11 & 12

AATCC, Metropolitan Section, New York, Jan. 16

National Plant Engineering & Maintenance Show, Convention Hall, Philadelphia, Jan. 22 to 25

National Cotton Council, 24th annual meeting, New Orleans, Jan. 29 & 30

February

AATT, annual conference, Hotel Commodore, New York, Feb. 7

American Society for Quality Control, Textile and Needle Trades Div., annual conference, Clemson House, Clemson, S. C., Feb. 15 & 16

Textirama, 5th international textile, knitwear, and clothing trade fair, Floraliapaleis, Ghent, Belgium, Feb. 16 to 20

March

Southern Textile Methods & Standards Association, semiannual meeting, Clemson House, S. C., March 15 & 16

Textile Quality Control Association, spring meeting, Poinsett Hotel, Greenville, S. C., March 22 & 23

Southern Cotton Association, annual convention, Hotel Peabody, Memphis, Tenn., March 28 to 30

American Cotton Manufacturers Institute, annual meeting. Palm Beach Biltmore Hotel, Palm Beach, Fla., March 29 to 31

What you should know about STARCH*

YOU PROBABLY KNOW—BUT OTHERS MAY NOT

When should compounds and waxes be added to size mixes?

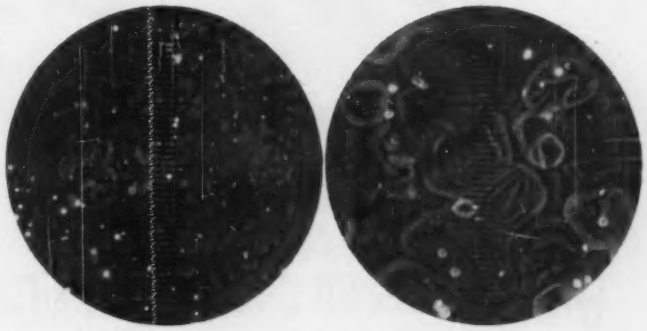

Figure 1 Figure 2

Photomicrographs taken at 382.5X magnification.

Compounds and waxes are important ingredients in size mixes. Their purpose and use are well defined. They make the starch film pliable and flexible and provide lubrication for the surface of the yarn. All of these factors aid in protecting the yarn from the slasher through the loom.

In many textile mills it is customary, in preparing a size mix, to add the starch to a predetermined amount of cold water, agitate the starch and water for about ten minutes, turn on the steam and immediately add the compounds and waxes. The procedure is good until the last step—adding the compounds and waxes to a cold slurry. This is wrong.

The fats, oils and waxes in the compounds added to uncooked starch retard or prevent complete gelatinization of the starch granules. In other words, the starch is inhibited. The results can be a partially cooked size which causes excessive shedding and yarn breakage.

To demonstrate the above action, The Hubinger Company's laboratory made photomicrographs of cooked starch. In Fig. 1, compounds were added after the starch slurry had been heated to 200° F. In Fig. 2, compounds were added before starch was heated and then cooked the same as starch in Fig. 1. Note the large number of unopened starch granules in Fig. 2 compared with Fig. 1, which is a well-cooked and homogeneous size mix.

Therefore, to prepare a well-cooked, uniform size that will provide results desired, it is strongly recommended that compounds and waxes be added after the starch is completely gelatinized. They should be added ten to fifteen minutes before the end of the cooking cycle to allow for melting and complete dispersion. When charging a cooking kettle with starch slurry, the level should be adjusted so that 15 to 20 inches outage remains between the cooked size level and the top of the kettle. This outage is important to prevent hot size from splashing on the size maker when adding the compounds.

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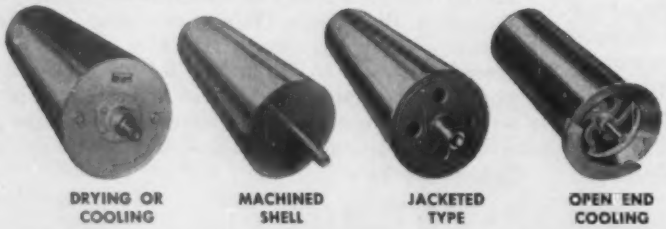

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ADV. NO. 257

TEXTILE WORLD . . .

Advertisers' Literature

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A-350—Pneumatic roll picker. Descriptive literature is yours on request. M-B Products.

A-351—Rotary joints. For joints to fill all needs, write for Catalog J-2002. The Johnson Corp.

A-352—Factoring. For information write for "Profit Through Factoring." Walter E. Heller & Co.

A-353—Controls-cloth guides. Catalog EG84 lists controls for cloth and web guiding systems. GPE Controls, Inc.

A-354—Salt. Request information on Chemical Grade "999" Salt and Purex Salt. Morton Salt Co.

A-355—Loom mounts. Free sample and book on mounts obtained on request. The Felters Co.

A-356—Winders. Write for Brochure 506. Foster Machine Co.

A-357—Double-knit machine. Request free booklet on this important advance in the interlock field. Singer-Supreme Co., Inc.

A-358—Testers. Send for Bulletin CRE. Scott Testers, Inc.

A-359—Resins. Write for New Piccotex Data Book. Pennsylvania Industrial Chemical Corp.

A-360—Speed indicators. For information write for Catalog N. Jones Motrola Corp.

A-361 — Washer control system. For details write for new data sheet 220-221. The Foxboro Co.

A-362—Slashers. Illustrated catalog "Tomorrow's Slashing Today" is yours on request. Cocker Machine & Foundry Co.

A-363—Hydraulic power unit. For complete description and detailed specifications, request Bulletins 101 and 102. Fife Mfg. Co., Inc.

A-364—Dyeing, drying, and finishing machinery. In writing for literature, mention machines that interest you. Turbo Machine Co.

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SUITABLE MODELS FOR ALL CONDITIONS

ALL MODELS OPERATE UP TO 325 KNOTS PER MINUTE CONTROLLED BY VARIABLE SPEED MOTOR DRIVE

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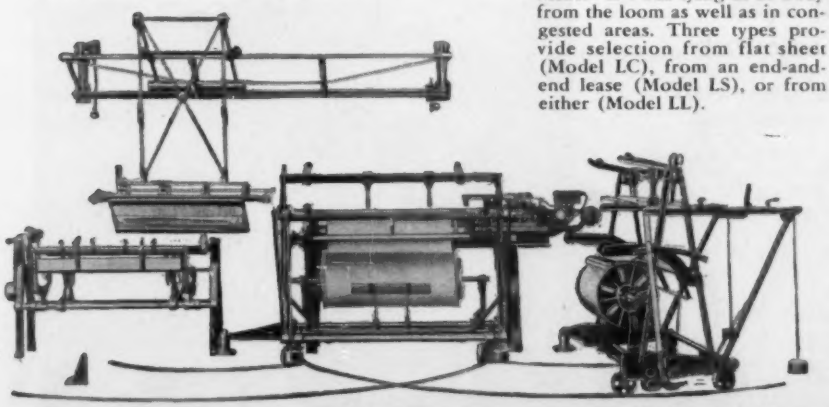
Model "M". Available in 36" (915 mm) through 126" (3200 mm) maximum warp width capacity. Multiple frames permit advance loading. Three types provide different methods of selection.

15" (380 MM) PORTABLE

Model "L". For tying at or away from the loom as well as in congested areas. Three types provide selection from flat sheet (Model LC), from an end-and-end lease (Model LS), or from either (Model LL).



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TEXTILE WORLD . . . News About Suppliers

ALLIED CHEMICAL CORP., Newark, N. J., is opening a laboratory, office, and warehouse at 3710 Northmore Street, Charlotte, N. C. The new facility will distribute Azogen printing colors for the textile industry in the South. Kenneth C. Laughlin has been appointed assistant to the director of research and development, National Aniline Div. . . . **AMERICAN AIR FILTER CO., INC.**, Louisville, Ky., has elected Arthur T. Miller vice president of its sales company, Minor-Webber, Inc., Cleveland. . . . **AMERICAN CYANAMID CO.**, New York, has named Clyde N. Whitesides sales manager for the textile chemicals department in Bound Brook, N. J. Quittman M. Rhodes succeeds him as southern district sales manager, textile chemicals department, in Charlotte, N. C. Fibers Div. has transferred Harry Wrench, field technical sales representative for yarns and fabrics, to its Providence sales office.

AMERICAN ENKA CORP., New York, has appointed Dr. Frits Prakke general manager of the rayon division in addition to his duties as vice president. Claude S. Ramsey Jr. is general manager of the nylon division. H. G. Heedy has been named assistant general manager, rayon staple fiber. M. F. Wesenhagen is assistant general manager, rayon filament yarn. S. W. Holmes is rayon merchandising director and Jay Kaner nylon merchandising director. . . . **AMERICAN MAIZE-PRODUCTS CO.**, Hammond, Ind., has elected William Ziegler III secretary and assistant treasurer. E. Halsted Platt is treasurer and assistant secretary. They succeed Homer P. Goff Jr. who retired. At a cost of $500,000, the firm is installing special starch facilities at its Hammond plant. . . . **AMERICAN VISCOSE CORP.**, Philadelphia, has made two appointments in its Merchandising and Product Development Dept. Virginia Stockfish is staff representative. Douglas H. Gordon is responsible for coordinating merchandising projects in the knitted outerwear field. Film Div. has named Roy N. Miller sales representative with the Atlanta district sales office.

J. ELBERT BUTTERWORTH (left) has retired as president and chairman of the board after 45 years of service with H. W. Butterworth & Sons Co., Bethayres, Pa. WILLIAM P. CRAWLEY (center) is sales representative in Fiber Development Div., Hercules Powder Co., Charlotte, N. C. Dr. Aimison Jonnard (right) has been appointed vice president, Celanese Chemical Co., New York.

AVISUN CORP., Philadelphia, has appointed John S. Dartnell merchandising manager. . . . **H. W. BUTTERWORTH & SONS CO.**, Bethayres, Pa., has named Eric B. Norman general sales manager. . . . **CELANESE CORP. OF AMERICA**, New York, has formally opened a laboratory devoted to pioneering new uses for polymers in plastics. The new facility, located in Clark, N. J., is part of Celanese Polymer Co. . . . **CHEMORE CORP.**, New York, and Novamont Corp. have moved to new quarters at 100 East 42nd Street, New York. . . . **CHEMSTRAND CORP.**, New York, has promoted Richard C. Brown to coordinator, evaluation and planning. Jerome

QUALITY DYEING MACHINES FOR QUALITY DYEING

KWG STAINLESS STEEL
PADDLE WHEEL MACHINE

These versatile machines handle all fabrics in either strip, or finished form, also hosiery and tapes.

Available with or without covers and indirect heating coils.

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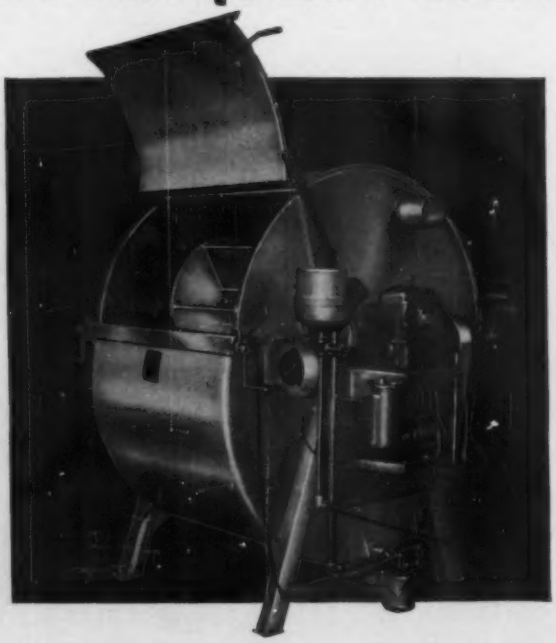
Skein dyeing machines 75 to 1000 lb. capacity.

Zipper tape and narrow fabric skein dyeing machines 100 to 500 lb. capacity.

KWG DUO-FLO Circulating Type skein dyeing machines for high bulk orlon, other man made and natural yarns.



Klauder Weldon Giles MACHINE COMPANY Adams Avenue and Leiper Street, Philadelphia 24, Pa.

B. Edelman is supervisor, apparel merchandising. . . . **CIBA CO., INC.,** Fair Lawn, N. J., has announced that Paul F. Wilson Jr. has joined the firm as technical supervisor, chemical specialties laboratory, in Charlotte, N. C. . . . **CLEVELAND CRANE & ENGINEERING CO.,** Wickliffe, Ohio, has appointed Hodgson Equipment Co., Tulsa, its sales representative in Oklahoma and northwest Arkansas for Cleveland Tramrail overhead materials-handling equipment. . . . **CONTAINER CORP. OF AMERICA,** Chicago, is building a folding carton plant at Carol Stream, Ill. The firm hopes the 350,000-sq.-ft. plant will be in operation by the end of 1962. . . . **CONTINENTAL GIN CO.,** Birmingham, is expanding its manufacturing plant in Prattville, Ala. The program, costing more than $1.5-million, is designed to increase manufacturing capacity by 50%. The firm will also transfer its executive, engineering, and sales offices to a new building adjoining the main manufacturing plant in Prattville early in 1962. . . . **CROMPTON & KNOWLES INTERNATIONAL LTD.,** Worcester, Mass., has promoted James S. Calvo to sales manager, textile machinery, for South America. . . . **CROSROL CARDING DEVELOPMENTS, INC.,** Greenville, S. C., has been established to market Crosrol cotton web purifier and related textile equipment. . . . **CROWN CHEMICAL CORP.,** Providence, has elected George W. Sarti vice president in charge of the company's Southern operation.

DIAMOND CRYSTAL SALT CO., St. Clair, Mich., has named Jack F. Kofoed to the new position of product marketing manager. James A. Selbee succeeds Earle B. Adams as regional manager of North Carolina, South Carolina, and Virginia. . . . **DOW CHEMICAL CO.,** Cleveland, has promoted James J. Bader to product manager for industrial products, Dobeckmun Div. He succeeds John T. Hastings, who resigned. . . . **DRAPER CORP.,** Hopedale, Mass., has signed an agreement with Page Belting Co., Concord, N. H. Draper will offer Page Check Control as optional equipment on new looms in the United States and Canada. . . . **E. I. DU PONT DE NEMOURS & CO.,** Wilmington, announces that Frank H. Coker has retired after 38 years with the firm. Lester S. Sinness succeeds Andrew E. Buchanan Jr. as general manager, Textile Fibers Dept. Russell C. Weigel is assistant general manager. In the Polychemicals Dept. Roy L. Schuyler Jr. has been promoted to director of Polyolefins Div. Textile Fibers Dept. has transferred John R. Emery to the New York office as marketing manager. Ralph W. Jones Jr. succeeds him as marketing manager for rugs and carpets. The firm will form a new, wholly owned German subsidiary, Du Pont Chemie G.m.b.H., for the sale of textile fibers. Technical Laboratory of the Dyes and Chemicals Div. was shown for the first time to a group of 250 textile industry representatives. The laboratory in Deepwater Point, N. J., has been modernized completely during the past 2 years.

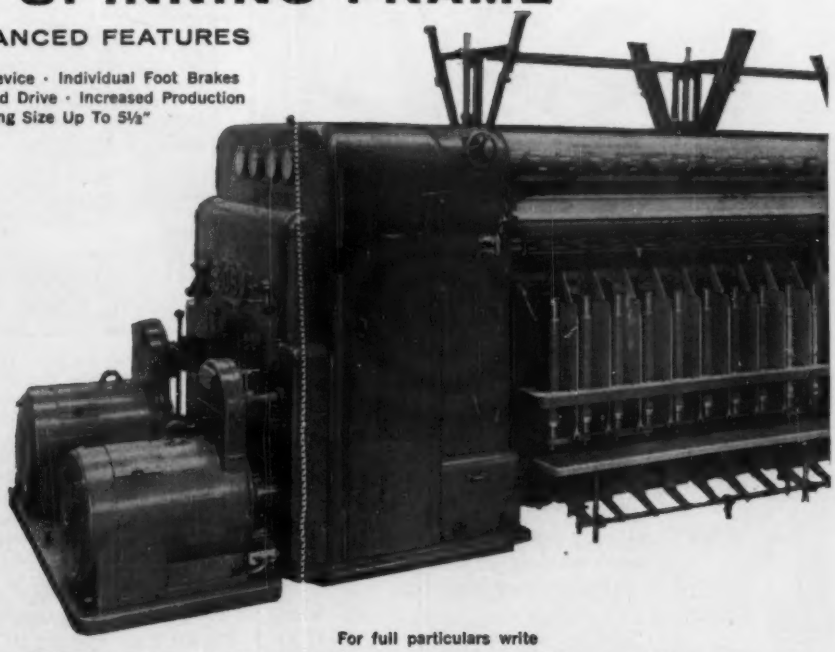
PAUL J. HAAS (left) has been named director, Singer Fidelity, Inc., Philadelphia. WILLIAM O. McMILLAN (center) is vice president in charge of sales, Scott & Williams, Inc., Laconia, N. H. L. C. WALL (right) has been named to assist J. K. Taylor, assistant director of sales, Sonoco Products Co., Hartsville, S. C.

DURANT MFG. CO., Milwaukee, has appointed Willard H. Brown manager of manufacturing for supervising the operation in Watertown, Wisc. Harold F. Bemm is manager of Customer Service Dept. . . . **FRANK W. EGAN & CO.,** Somerville, N. J., has doubled its plant facilities with the completion of a $350,000 program. . . . **W. F. FANCOURT CO.,** Greensboro,

"MAGNUM" SPINNING FRAME

MANY NEW and ADVANCED FEATURES

Larger Yarn Package · Unkinking Device · Individual Foot Brakes
Paper Tube 18" High · Variable Speed Drive · Increased Production
Lower Cost Per Pound · Ring Size Up To 5½"



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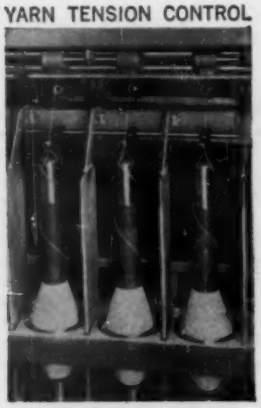
GIANT SPINDLE WITH
YARN TENSION CONTROL



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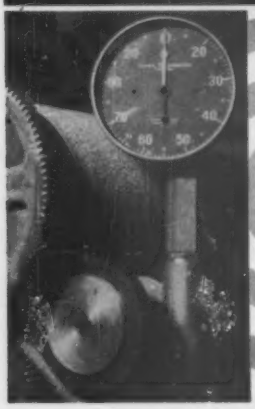
JONES SURFACE SPEED INDICATORS

(measures feet per minute, yards per minute)



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JONES MOTROLA CORP.

Stamford, Conn.

ADV. NO. 258

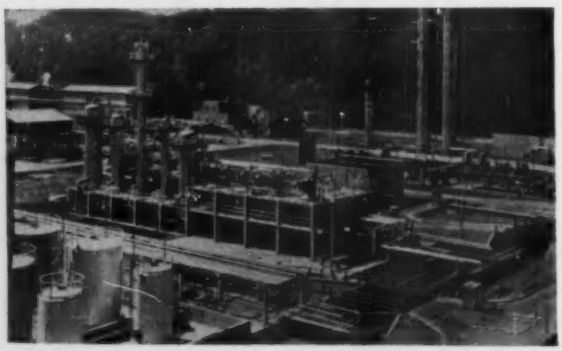
ADV. NO. 259

News About Suppliers . . . *Begins on page 174*

has elected Donald H. Loeber assistant secretary in addition to his duties as assistant to the president. . . . **FIFE MFG. CO.,** Oklahoma City, has appointed R. W. Pickles representative for greater New York City and upper New York state. . . . **FMC CORP.,** New York, will build a new multimillion dollar plant in Charleston, W. Va. to produce toluene diisocyanate, a major component of polyurethane plastics. . . . **FOXBORO CO.,** Foxboro, Mass., has named Earle W. Pitt Western field sales manager. Steve Kerstner succeeds him as branch manager of the Los Angeles office. Earl M. Kelly is regional manager of the Cleveland territory.

GENERAL ANILINE & FILM CORP., New York, has elected John I. Snyder Jr. chairman of the board and chief executive officer. . . . **GOODYEAR TIRE & RUBBER CO., INC.,** Akron, has signed a 10-yr. pact with Toyo Spinning Co., Ltd., Osaka, Japan. Goodyear will furnish technical data for the design construction, and start-up of a 10-million pound per year plant to be built in Japan. The new plant will manufacture polyester plastic resin for synthetic textile fibers. . . . **HOOKER CHEMICAL CORP.,** New York, has announced that William J. Cannon has joined the firm as manager of advertising and sales promotion with headquarters located in Niagara Falls, N. Y.

HUNGERFORD & TERRY, INC., Clayton, N. J., has promoted Albert J. Nauta to general sales manager in charge of all domestic and foreign sales. . . . **MINNEAPOLIS-HONEYWELL REGULATOR CO.,** Minneapolis, has named Robert G. Butterwick advertising and sales manager for the Rubicon Div. and the Special Systems Div. . . . **MONTECATINI SOCIETA GENERALE,** Milan, Italy, has completed licensing agreements with the following Japanese companies to produce its isotactic polypropylene plastic and fiber: Mitsubishi Petrochemical Co., Mitsui Chemical Industries, Sumitomo Chemical Co., Mitsubishi Rayon Co., Toyo Rayon Co., and Toyo Spinning Co. . . . **NATIONAL STARCH & CHEMICAL CORP.,** New York, has selected a site at Seadrift, Texas, for its new vinyl acetate plant. . . . **NORTH CAROLINA TEXTILE MANUFACTURERS ASSOCIATION, INC.,** Charlotte, N. C., has moved to 1111 North Carolina National Bank Building.



MONTECATINI SOCIETA GENERALE has dedicated its polypropylene plant in Neal, West Virginia. The new plant can produce 30-million pounds of isotactic polypropylene for plastic applications annually.

RAYBESTOS-MANHATTAN, INC., Passaic, N. J., has named John McKinlay assistant manager Eastern sales region for Industrial Rubber Products and Mechanical Packings. . . . **ROBERTS CO.,** Sanford, N. C., sustained a loss estimated at $1-million when its main plant was destroyed by fire. . . . **STANDARD MILL SUPPLY CO.,** Providence, has recently elected Robert D. Barr Jr. president. . . . **TEXTILE MACHINE WORKS,** Reading, Pa, has appointed Walter Imboden chief engineer. . . . **WARNER & SWASEY CO.,** Cleveland, has purchased Lahr Machine & Tool Corp., Toledo. . . . **WHITIN MACHINE WORKS,** Whitinsville, Mass., has signed an agreement with Trutzschler & Co., Rheydt-Odenkirchen, Germany. Whitin will sell and service the complete line of Trutxschler opening, cleaning, and picking machinery.

TEXTILE WORLD . . .

News About Men

FRANK H. LESLIE (left) has been elected a senior vice president and member of the board and ELY R. CALLAWAY JR. (right) an executive vice president, Burlington Industries, Inc. (New York).

Abbeville Mills Corp. (Abbeville, S. C.) has made the following appointments: **J. A. Botts,** production control manager; **William F. Umstaedter,** plant production manager; **Charles B. Palmer,** plant technical manager; and **Howard R. Walker,** product development manager.

Boris Shlomm is vice president of Woonsocket Spinning Co. (Woonsocket, R. I.) and Atlantic Wool Combing Co. (Manville, R. I.).

W. R. MacIntyre, president of Joseph Bancroft & Sons Co., has been elected a director of Indian Head Mills, Inc. (New York).

Gerald Kornfeld has resigned as advertising and sales manager, Bates Fabrics Inc. (New York).

Two promotions have been announced by Belding Corticelli, a division of Belding Heminway Co., Inc. (New York). **Raymond Miller** is assistant manager, fabrics division. **Morris Zingler** is manager of fabric production.

Lewis West has been named chemist, Buckeye Fabric Finishing Co. (Coshocton, Ohio).

Robert N. Stokes is retiring as assistant treasurer, Burlington Industries, Inc. (Greensboro, N. C.). **John L. Mortimer** has been elected president of the newly formed Burlington Automotive Fabrics Co. (Rocky Mount, N. C.).

Richard G. Holland is managing the Infants' Div., William Carter Co., (Needham Heights, Mass.) He succeeded **Kenneth M. Childs,** who retired after 38 years as manager of the division. **Austin S. Callaway** is managing new Selected Products Division.

Oscar Pollinger will head a newly formed Finished Apparel Fabrics Dept. of Chicopee Mills, Inc. (New York). **Frank C. Bennett** has resigned as president of Anniston Mfg. Co. (Anniston, Me.).

Fulton Cotton Mills (Atlanta, Ga.) has promoted the following: **John F. Chilton,** manager of technical division; **Lester J. Duckett,** superintendent of yarn manufacturing; **Duncan M. Veal,** superintendent of weaving and slashing.

Gilbert T. Owren and **R. Sidney Flood** have been elected vice presidents of Glen Raven Mills, Inc. (New York).

Two newly created positions have been filled at Glenoit Mills, Inc. (New York). **Jay Ochser** is sales manager of men's and boys' wear division. **Irving Schwartz** is sales manager, women's wear division.

Charles Hayes and **Maurice Fishman** have joined the newly established dyeing division of Guilford Mills, Inc. (Greensboro, N. C.).

John W. Walker is general

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Laurel Emulsions

. . . first in conditioning and lubrication of both natural and synthetic yarns.

One of these—or another—Laurel Emulsion for natural and synthetic yarns will do a better job, with less work, at lower cost. There's one best emulsion in the Laurel Line to condition and lubricate any yarn . . . better.

LAUREL RUXITE A

. . . a quality lubricating and conditioning agent for cotton, wool, and synthetic spun yarns. Adaptable to rayon novelty yarns, it improves softness and running qualities. Forms highly stable emulsions with water.

LAUREL HYDROWAX HC

. . . especially prepared for tufting yarn producers. Restores rayon, cotton, or blended yarns to proper condition and imparts lubrication for better-running yarns. Easy to apply evenly, it's completely saponifiable for protection in scouring and dyeing.

LAUREL HYDROCOP and 3B SOFTENER

. . . first choice of knitting yarn manufacturers. Gives smooth running and even stitches, making for stronger yarn with fewer breaks. Causes no odor or color changes; easy to prepare; for natural or synthetic yarns.

LAURELWAX EMULSION WG

. . . truly cold water dispersible and excellent for winding trough work. For treating cotton, wool, Orlon and other knitting and sewing yarns, it is used at no sacrifice in active content where hot water is a problem.

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Laurel

SOAP MANUFACTURING CO., INC.

TIOGA, THOMPSON & ALMOND STS. • PHILA. 34, PA.

Warehouses: Paterson, N.J. Chattanooga, Tenn. Charlotte, N.C. Greenville, S.C.

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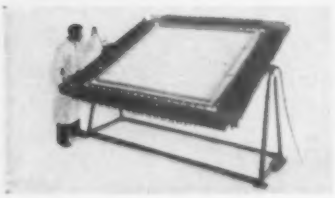
Complete Screen Making Machinery



- Pneumatic Stretching Frame
- POLY-COP Copying and Adding Machine
- Varnish Withdrawing Machine
- Drying Cabinets
- DUPLEX Dyestuff Strainer
- Longitudinal and Transversal Rakes
- Sample Steamer
- Chemicals for Screen Making

LÜSCHER BROTHERS LTD, (Obstalden)
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ADV. NO. 261

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News About Men . . . *Begins on page 177*

HOMER S. SMITH has been promoted to director of purchasing, Fulton Industries, Inc. (Atlanta).

WILLIAM C. ROSS is production manager of William Carter Co. (Needham Heights, Mass.).

manager of Kingsley Mill Corp. (Thomson, Ga.).

Vice president and general manager is **James F. Magarahan's** new title at Lyman Printing & Finishing Co., Inc. (Lyman, S. C.), a subsidiary of M. Lowenstein & Sons, Inc.

Bert Amador will style fancy worsted suiting at Paragon Worsted Co. (New York).

Homer M. Carter has been elected president of Pepperell Mfg. Co. (Boston). He succeeds **Brackett Parsons,** who retired.

After nearly 50 years in the textile industry, **Charles Norman** has retired from Riegel Textile Sales Corp. (New York).

J. P. Stevens & Co., Inc. (New York) has made four new appointments. **James Harrell** succeeds the late George P. McClenaghan as officer in charge of the 23 plants in the Cotton Div. **Whitney Stevens** has been named head of merchandising and sales for all woolen and worsted divisions. **John P. Stevens III** is head of women's wear woolen and worsted sales. **Gordon L. Busher** is plant superintendent of the Worumbo Plant (Lisbon Falls, Me.).

The following seven division managers of Beaunit Mills, Inc. (New York) have been elected vice presidents: **Buford J. Goldstein, C. K. Watson, John L. Hathaway, R. C. Reinhardt, Samuel Cohn, Joseph Buda,** and **Harry Fain.**

Robert C. Hunzinger has retired as president of Cravenette Co. of U.S.A. (Boston). **Fred Barbaro** has been named vice president and general manager.

Hugh J. Toumey has been promoted to the newly created position of general sales man-

WALTER J. MEADORS is assistant plant manager Lanett Mill, West Point Mfg. Co. (Lanett, Ala.).

LOUIS R. KUHLMANN JR. has been assigned to the New York office of Chicopee Mills, Inc.

ager for all consumer products, Cannon Mills, Inc. (New York). **John H. Brennan** succeeds him as head of towel sales.

Benjamin G. Thrift will manage Cone Mills Corp.'s pilot plant and fabric development sections of the research and development division in Greensboro, N. C.

After 25 years of service with M. Lowenstein & Sons, Inc. (New York), **Alfred H. Zeledon** has retired.

Edwin A. Taylor is in charge of sales to the jobbing and converting trade for Lowndes Products Inc. (Philadelphia) new line of nonwoven fabrics.

Robert Amory will retire as executive vice president of Springs Mills, Inc. (New York) this month. **Burnet Valentine** will succeed him.

Sherwin Joselson has been named sales manager of the knit goods division, Crestwood Textile Corp. (New York).

Ajalon A. Tillery has joined Turner Jones Co., Inc. (New York) to assist in the merchandising and fabric development of denims and new items for Canton Cotton Mills.

York Knitting Mills, Ltd. (Woodstock, Ont.) has elected **J. D. Woods,** chairman of the board, and **J. D. Woods Jr.,** president.

Lex Bassinger has been named manager, Stead & Miller Division plant of Collins & Aikman Corp. (Concord, N. C.).

Mrs. Elsie Murphy, president of Old Bennington Weavers, Inc., has been elected vice president of Woolens & Worsteds of America, Inc. (New York).

American Cotton Manufacturers Institute, Inc. (Charlotte, N. C.) has named the following to the board of directors: **Richard R. Higgins,** president of Kendall Co.; **J. Spencer Love,** chairman of the board of Burlington Industries, Inc.; and **Fred M. Lyon,** president and treasurer of Micolas Cotton Mills, Inc.

Association of Yarn Distributors (Philadelphia) has elected the following: **Arthur M. Currier,** president of Latta Currier Co., president; **E. F. Sherman,** John F. Street Co., vice president; **Mars Bishop,** Tillinghast Styles Co., treasurer; and **T. Ewing Montgomery,** legal representative, secretary.

OBITUARIES

Leon H. Bakst, 52, president, United Textile Machinery Co., Fall River, Mass.

Emil W. Bauman, 61, superintendent, Hess, Goldsmith & Co., Inc., Wilkes-Barre, Pa.

James F. Broderick, 61, retired plant superintendent, Hoosac Mills Corp., North Adams, Mass.

James O. Elmore, 54, plant superintendent, Seminole Mills, Statesville, N. C.

Albert Johnson, 51, assistant manager, Lanett Mill division of West Point Mfg. Co., Lanett, Ala.

George P. McClenaghan, 63, vice president and director, J. P. Stevens & Co., Inc., Greenville, S. C.

James E. Millis, 77, chairman of the board and former president, Adams-Millis Corp., High Point, N. C.

Douglas C. Newman, 64, retired director of sales, Dyes and Chemicals Div., E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

William E. Power, 53, salesman, Bates Fabrics Inc., New York.

George Royle Jr., 79, founder of firm, George Royle & Co., Philadelphia.

Clifford B. Terry, 76, retired salesman, Foster Machine Co., Westfield, Mass.

M. Harry Whelan, 84, former purchasing agent, Pepperell Mfg. Co., Boston.

Charles T. Woollen, 50, manager of Charlotte operations, Lassiter Corp. of Riegel Paper Corp., Charlotte, N. C.

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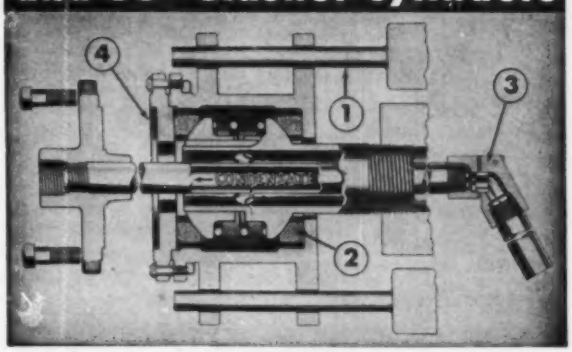

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1 Butterworth 56" Rubber Belt Compressive Shrinking Range—1956
1 Proctor & Schwartz Roller Cure Dryer 24'
34 S.S. Dry Cans 90 x 30" dia.
1 Textile 70' Enclosed High Speed Tenter Frame and housing
1 Perkins 3 roll 100 ton Hydraulic Calendar
2 Perkins 5 roll 50 ton Calendars—1948
61 S.S. Dry Cans 47", 30 lbs. pressure
44 S.S. Dry Cans 142 x 23" dia.
8 Morrison S.S. Dry Cans, 60" wide, 50 lbs. pressure
1 Cocker Indigo Dye Range, 1948

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8 Textile & Werner S.S. Dye Jiggs 50" to 70"
2 Blickman Dye Boxes (Stainless steel)

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1 Rice, Barton & Fales 8 color Super Precision Print Machine 50"
1 Textile 8 color Print Machine 54"
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1 Votator, Stainless Steel, Age 1954
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3 Hayssen Cello Wrapping Machines Age 1953
3 Progressive Heavy Duty Inspecting Machines—1958

OTHER MODERN TEXTILE MACHINERY

25 Draper XD Looms, 54" reed, Diehl and Motor, 1951
56 Universal #110 Uptwisters, 184 spdls., 2 lb. headless package, 1950
100 Whitin Model F. Spinning Frames 3" ga.

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Cans about 30 inches wide, 15 dia. Ideal for braids or light tapes or web, produce 3 to 5 yards per minute, 20 ends.

20—32, 50—44, 40—48 Carrier #2
About 4 Wardwell 16 carrier late model Whiting Quiller 378 ends model F.

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5½ GAUGE • 9" TRAVERSE • 4½" RINGS • 200 spindles each—knee brakes, separators, all have pin creels —motorized, 15 HP, 550 volt—60 cycles. Machines in like new condition. Bobbins available with machines.

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80 PKG.—⅜ TUBE—COMPLETE WITH CARRIERS AND BROWN INSTRUMENTS

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18—Model XRO, 60 to 96" cloth, dbl arch
65—Model XU, 36, 62" cloth, dbl arch
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32—XD Model, 64" cloth, 20 h dobby, Unifil

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22—C&K S-6, 80" B/S 2x1 for Jacquard Head
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34—C&K C-4, 72" B/S 4x4, 20-h dobby
8—C&K Woolen looms, 110", some side cam
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1—Morrison Cont. Dye Range 60", Pad—15 ton, 2 Williams Units, 3 Washers, M.G. Set, Age 1948

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1—Verduin Hyd. Calender-70" wide, 40 ton—1960

1—P & S Loop Dryer, 60' long, 126" sticks—1948

1—James Hunter Gas Fired Tenter Finishing Range: Padder, Pre-Dryer, Tenter and Housing

1—Tenter Palmer Range; Werner 70" Pad, 10 ton, V.V. 60' x 66" Tenter Frame, Nat'l Gas Fired Housing

2—Riggs & Lombard Encl. Dye Boxes, 6' wide, 65" deep

8—Mezzera Auto. Enclosed Dye Jiggs-66½" wide

2—V.V. Stainless 8' Duplex Dye Boxes

1—Atlas Laundro-Meter, Model B-5—1953

28—Draper XD Looms, 54½" bet. swds, Diehl Drive—1951

42—C & K Model S6 Looms, 2 x 1 Box, 56" bet. swds—1949

24—C & K Model W3, 82" Looms, 25 harness, motor

10—C & K Model W3, 64" Looms, 25 harness, motor

1—Cocker 9-can Slasher, 60 x 30" cyl. M.G. set

1—Johnson 7-can Slasher, 62" x 30" cyl. M.G. set

1—Cyclotherm Pkg. Boiler, 690 lb./hr. 15 HP—1950

1—I-R Compressor 12 x 8, Class ER1, 40 HP, 550 volts

1—Foster #102 Paper Cone Winder, 100 spdls.

1—Smith-Drum Package Dye Machine, 500 lb.—1947

1—Davis & Furber 6 bar Mixing Picker-36", 1957

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1—Scott X-3 tester, 0-25; 0-50 lbs., recorder
5—Rodney Hunt tru-shade dye machines, 6' wide, squeeze master rolls
5—Stainless steel tanks, 4' x 4' x 10' wide
200—Barber-Colman section beams, 54½" x 26" x 9"
1—Terrell quill stripper, ret. conv., hoist

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3—Fidelity Reelers—2 Arms
1—Arnold Rubber Covering Machine
3—Atwood 10B Doublers
8—U. S. HDless Pkg. Twisters
70—Foster 75A Winders
5—Universal #45 Winders
2—Formers with Backstand
9—Garced Tube Winders 50 Lb.

S.S.Skein Dryers—1-12, 1-10, 1-7 Arm
2—Franklin Dyers 150 & 300 Lb.
10—Atwood & Sipp Redraws
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10M—Franklin Dye Springs S.S.
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1—70" Heat Setting Machine, gas fired.
1—70' x 66" Enclosed Gas Fired Tenter Range.
1—57" Compressive Shrinking Range.
1—Junior Size All Stainless Steel Continuous Bleach Range.
2—70" 2 Roll Padders, pneumatic.
9—40" to 64" 6 to 8 color Printing Machines.
6—3 Roll Hydraulic Finishing Calenders, 50", 55", 65", 72" widths, up to 70 ton pressure
1—168" Set Pneumatic Squeeze Rolls.
1—Tricot Finishing Range, with Setting Unit, etc.
1—Set 5—102" x 23" Stainless Steel Dry Cans, ball bearing.
1—50" 2 Roll Padder, ball bearing.
3—Singers, 60", 70", 80" widths.
2—64" Selvedge Marking Machines.
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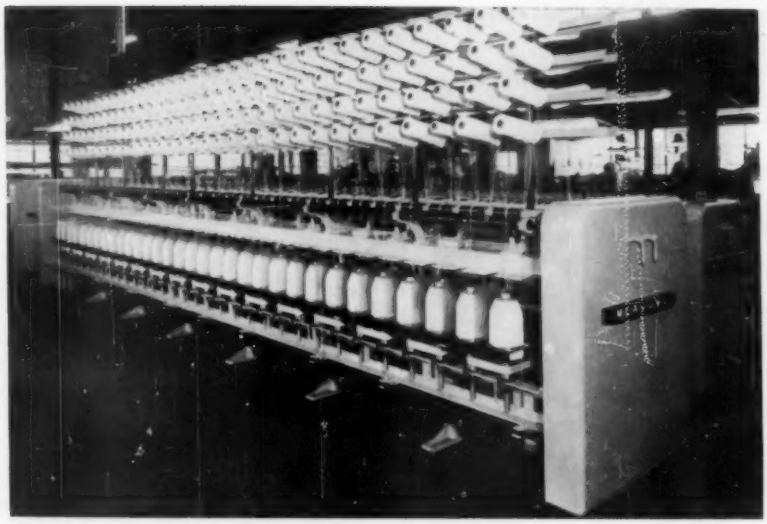

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